DELHI UNIVERSITY
LIBRARY

DELHI UNIVERSITY LIBRARY

Cl No. R19837 G4

Ac No. 21210 Date of release for loan

This book should be returned on or before the date last stamped below An overdue charge of 0 5 nP will be charged for each day the book is kept overtime

UNIVERSITY OF CALIFORNIA PUBLICATIONS

IN

PHILOSOPHY

VOLUME 17

EDITORS
GEORGE P. ADAMS
J. LOEWENBERG
STEPHEN C. PEPPER

POSSIBILITY

LECTURES DELIVERED BEFORE THE
PHILOSOPHICAL UNION
OF THE
UNIVERSITY OF CALIFORNIA
1933

UNIVERSITY OF CALIFORNIA PRESS
BERKELEY, CALIFORNIA
1934

UNIVERSITY OF CALIFORNIA PUBLICATIONS IN PHILOSOPHY
Volume 17, pp. 1–224
Issued October 31, 1934
Price, $2.25

UNIVERSITY OF CALIFORNIA PRESS
BERKELEY, CALIFORNIA

CAMBRIDGE UNIVERSITY PRESS
LONDON, ENGLAND

PRINTED IN THE UNITED STATES OF AMERICA

CONTENTS

WHAT MAKES POSSIBILITY POSSIBLE?

BY

GEORGE P. ADAMS

WHAT MAKES POSSIBILITY POSSIBLE?

GEORGE P. ADAMS

IT IS THE PARADOX of experience that it denotes both that which is present, literally had and possessed, denotably there, confronting us, and also a domain of prophecy and potency, things eventual, tendencies, and possibilities, holding the promise or threat of something more to come Experience is saturated with such reference to that which transcends, at any given time or place, what is then and there immediately present and directly verified. Were this not so, were experience restricted to an awareness of what literally confronts us in present given fact, then expectancy, watchful waiting, purposeful planning, attention, exploration and investigation, memory and remorse would be utterly nonempirical mysteries The tiger stalking his prey, the hound following a scent, the astronomer scanning the heavens, the prospector searching for gold, of these and a thousand like transactions is the stuff of experience primarily comprised

To be sure, something in some sense immediately had and experienced, something here and now present, provides the *pou sto*, the anchor or spring board of every transaction and venture of experience And somewhere in every experience there might be discerned the boundary between such immediately present data and that more outlying, distant domain not here and now immediately possessed The history of the problem of knowledge is the history of what reflective thought has made of this situation Something is immediately present in experience I shall use the term "actual" to denote any such ingredient of experience. All experience contains something actual But no less idubitably does the world which is lived in and experienced contain that which transcends the actual, a trans-actual or hyper-actual We live and act and know across that boundary, wherever it lies, between the immediate and the remote, the given and the hoped or feared for, present data and what they suggest, imply, portend, and mean

I propose to approach the problem of the meaning and the status of possibility in the light of this pervasive aspect of experience. But before I come to the question of possibility, it will be useful if I formulate briefly certain propositions concerning this general aspect of experience I shall do so summarily and without argument

1. We have no experience of an isolated actual There is never in experience an awareness of a pure given and of nothing else besides There is no such thing as knowledge by acquaintance alone, that is, knowledge in which the content known completely coincides with something directly and immediately given Putting it the other way around, what is actually given can never be known by itself in total isolation from everything not so given This means the shipwreck of any theory of knowledge which supposes that the world of things known can be constructed out of entities immediately present in experience, given and actual

2 The simplest object of awareness is complex Its complexity is twofold It is a relational and not a relationless entity Also—and this will prove more interesting for our present problem—the simplest object of experience presents itself not only as a something here and now, as a *this*, but also as having a nature or character, as a *such* The most elementary or atomic entity of experience or awareness is a this-such There is a fundamental distinction between its thisness and its suchness, between the *that* (or *this*) and the *what* Its being *this* precludes its being another *this* or *that*. But its being of such and such a nature does not preclude identity with another similar nature, on the contrary, it implies at least the possibility of such identification I perceive a particular green patch Its being this green patch prevents it from being any other green patch But its being a patch of a certain kind, of a certain shade of green, implies the possibility of other exemplifications of the same nature. Even if one agrees, as I do, with Stout and others in holding that the color of this green patch is a particular, yet it is a particular *nature* and not a particular *this* which is here considered And because it is of this nature or kind, no matter how particular it is, the thought of other possible occurrences of this particular shade of green is germane to and implicated in the awareness of this particular shade of green Thus, the experience of the simplest and most elementary entity, so long as it is experi-

enced as having some nature, some *what* (and I do not know how, in the absence of any nature, anything could be experienced), implies the possibility of other occurrences of the same kind. That anything has a nature, and that this possibility exists, seem to me to say one and the same thing We are introduced to possibility in the most elementary object of awareness and experience

3 What of the *thisness,* as distinguished from the *suchness?* Surely the *this* is wholly actual, with no taint of possibility to lessen its actuality Even if it be admitted that to be or to have a nature is to have a potential spread beyond the actual occurrence, the here and now *this,* to other at least possible *thises,* isn't it the privilege (or defect) of the *this* to exclude everything actual or possible beyond just *this?* I do not think so The shadow or specter of possibility intrudes into the experience of *this* no less than it does into the experience of *such* It does so in several ways Let any *this* present itself so that one might say, "*this* at least exists" The word "exist," so Stout has reminded us, originally means to step out or forth, to come forth, to emerge "This exists" means "this stands out from a background" A background makes possible the existence, the stepping forth of the *this* Without such a background, no *this* Moreover, the *this* is what is pointed to, indicated, demonstrated, and denoted In pointing to this or that, I direct attention to it as an object of possible experience for you at the present time, or for me at some future time Affixing names and symbols to this and that is to do more than barely indicate through pointing It is at the very least, as Lewis has so well shown, predictive of other possible experience To designate this thing as an apple is to say what further experiences would ensue if one did thus and thus A series of hypothetical propositions is required to state and to justify the designation of any *this*

Experience, then, is never restricted to the actual The actual, as experienced, is surrounded by the trans- or hyper-actual Neither the future nor the past is actual as is the present In listening to music, the only sounds and harmonies which are actual are the ones being heard These actual sounds constitute a living present, moving like the crest of a wave through the entire symphony from beginning to end This is not to say that only the actual present exists or is real I am quite sure that both past and future events are real and may in some measure be known The

past is the background from which the actual present steps forth and exists, in being aware of any actual present, I am also aware of the nonactual but real past and future With respect to future, predictable events, Eddington writes

> I infer the existence in 1999 of a configuration of the sun, earth and moon which corresponds to a total eclipse The shadow of the moon on Cornwall in 1999 is already in the world of inference It is not easy to see in what way it will gain in status when the year 1999 arrives and the eclipse is observed [1]

Eddington can so state it only because he supposes—wrongly, as I think—that no physical state of affairs is ever directly experienced or actual (in my terminology) All physical objects and happenings are inferred, including those which are mistakenly said to be perceived now, they belong to the world of inference. If we abandon this assumption, as I think we must, then the eclipse observable in Cornwall in 1999, while in some sense it is real now, just as the battle of Hastings is a real event, will become actual only when and if there will be persons in Cornwall in 1999 to observe the eclipse

In situations such as this, we are confronted with the first major domain and meaning of the possible The actual is contrasted to and surrounded by that which is other and more than the actual This other and more than the actual is both the possible and the real But although more and other than the actual, the possible and the real are continuous with the actual In seeing a circular greenish patch in front of me and in naming it an apple, I am both positing a set of characters which are now real, continuous with, and linked to the shape actually seen, and asserting the possibility of experiences which I or you would have if we manipulated the apple in specific ways These possible experiences are likewise continuous with my present actual experience of greenish, circular shape Because of such continuity between this type of the possible and actual experience, I shall designate this as the "continuous possible" This is merely an abbreviation for "any possible which is continuous with and an extension of any actual experience" There is, we shall see, another meaning and domain of the possible There are possibles not thus continuous with present actual experience, but transcending, in a sense requiring careful

[1] *Proc Aristotelian Soc, Suppl*, X, 168

definition, both the actual and the real This second kind of possibility I shall designate as "transcendent possibility" But I wish first to consider some aspects of the class of continuous possibles—of entities which stretch beyond the actual, yet are continuous with the actual

The possible which is conceived as a continuation and extension of the actual is the realm of possible experience With respect to this realm and concept of possible experience, I shall make two comments First, as I have already noted, what is actually experienced may be contrasted with what is not, yet might be, under specifiable conditions, so experienced Or, it may be contrasted with what is said to be real, as having a being independent of its being experienced What is actually experienced may be thought of as a fragment of the wider realm of possible experience, or of a world with respect to which experience, actual or possible, is in a sense irrelevant Anyway, since we do sometimes contrast the actually experienced with possible experience, and sometimes with the real, a question arises concerning the relation between what is said to be real and what is said to belong to the realm of possible experience The center of the earth has never been actually experienced When now one says that the center of the earth is solid and not gaseous, what does one mean? For my own part, I am quite sure that I never mean merely that, if I were to dig a tunnel through the center of the earth and journey halfway through, I should then have actual experiences of the sort that I now have when I touch solid bodies Whatever is for me at the present time a possible experience can become actual only at some future time But when I assert that the center of the earth *is* solid, I intend to assert a present state of affairs and not a future one Moreover, the statement that if I or anyone else were to do something, I or the other person would have certain actual experiences, appears to me to be a statement about me or someone else rather than a statement about the center of the earth.

There are two alternative ways of describing the relation between possible experience and the real, depending upon which one of these is taken to be the more fundamental One may say By the real I mean nothing whatever except the possibility of further experience Or one may say 'By the possibility of further experience I mean the present reality of that which transcends actual experi-

ence in a manner different from that in which possible experience transcends actual experience The first of these two descriptions can, I suppose, be called pragmatic It is clearly set forth by Lewis.

> What does it signify [he asks] that there should be verifiably more to any object than is given in the single experience of it? It can mean nothing else than the possibility of other experiences, of a predictable sort, related to this experience in particular ways Any other kind of "more" attached to the presentation would be unverifiable [2]

The other way of describing the situation can be said to be realistic For the pragmatist of the type just referred to, it is possible experience alone which extends and connects fragmentary bits of actual experience For the realist, the realm of possible experience is not left hanging in the air, its possibility rests upon a reality continuous with the bits of reality disclosed by actual experience I am not always sure to what extent this difference between a pragmatic and a realistic interpretation of experience is a verbal one, but I am inclined to think that it is more than verbal For a pragmatist such as Lewis, the question, What makes any experience possible, What is it that confers upon possible experience its status of possibility, would, I am sure, be ruled out as meaningless Possible experience is the ultimate category There is nothing more ultimate which makes it possible This does not quite satisfy me The possibility of experiencing solidity at the center of the earth results from a state of affairs to which the term "possibility" is quite inappropriate The solid center of the earth is more than a possibility It is a reality continuous with the reality of the surface of the earth which is actually experienced The fragmentary bits and perspectives of nature which manage to filter through the channels of our sense experience and thus become actual for us need to be woven together, extended, and supplemented The non-actual filling of nature is continuous with the actualized portions—continuous in kind, in space-time, and in the modality of its being I do not know how piecemeal and scattered actualities can be cemented together to form a continuous order by entities which have merely the status of possibility

That the possibility of possible experience rests upon a reality continuous with the actual and not itself describable merely in terms of possibility is indicated by a second consideration The

[2] C I. Lewis, *Mind and the World Order*, p. 72.

distinction between the actual and the continuous possible—possible experience continuous with actual experience—is epistemic. What is actual and what is possible depends upon us, upon the position we chance to occupy, the direction of our attention, our powers of observation, and the like The fireplace in front of me is now actually experienced While I am experiencing it, the bookshelves behind me are objects of possible experience All I need do to transform them into objects actually experienced is to turn around Now it is the fireplace which is a possible experience It has ceased to be actually experienced Which of these two is to be actual and which possible depends wholly upon me, it being understood that both of them belong to one continuous, real world, independent of and indifferent to the direction of my gaze To say that the boundary between the actual and the possible is epistemic is thus to think of both regions as belonging to the real, and the boundary line as dependent upon the observer The continuous possible is the extended and supplemented actual, the actual expanded into and continuous with the real

Are there principles of a different type, possibilities which are not continuous with the presented actual, different in nature and status from, say, the center of the earth as an object of possible experience? Are there possibilities the distinction of which from either the actual or the real is not epistemic but constitutive? Do possibilities as such await our discovery, do they exist *in rerum natura?* I believe that there are such possibles, and the remainder of my discussion will be devoted to them In order to distinguish them from continuous possibles, I propose to call them transcendent possibles In so designating them, however, I would caution the reader not to conclude at once that I am to invoke a separate realm of subsistence and to populate that world with entities for which there is no place in the world of existing nature I may say that my views of the nature and significance of possibles other than the extended actual are the outcome of an attempt to avoid the Scylla of such a realm of subsistence transcending all that exists, and the Charybdis of a view which finds nowhere a legitimate place for objective possibilities I want objective and constitutive possibilities, and I do not want subsistent dualism Of course, what I or anyone else merely happens to want and to like has nothing to do with the validity of theories, but I may be pardoned for so stating

the matter in order to give some indication of the general drift of my discussion

A transition to a kind of possibility different from the continuous possible is indicated by an aspect of the realm of possible experience All the objects of possible experience are more than possible They are extensions of the actual But there are possible verifications of the real, the extended actual, which are not and never will be real The taste of poisonous mushrooms, I hope never to verify. If men are judicious in picking mushrooms, the taste will never be verified The taste itself is a possible actual (To defend this statement would require a discussion of the status of secondary qualities which I must here forego) The term "possible experience" is ambiguous It may mean either the object of a possible experience, or it may mean the possibility of verifying, of actualizing such an object in or through experience

There is an indefinitely vast realm of possible verifications, of possible experiences, which may never become actual verifications; they always remain transcendent to actual experience Royce, in the discussion of his third conception of Being, laid stress upon this situation

> There are countless possible experiences which you never test .. The prices and credits of the commercial world involve far more numerous types of valid possible experience than any prudent merchant cares to test, for if these facts are valid as they are conceived, their very Being includes possibilities of unwise investment and bankruptcy, which the prudent business man recognizes only to avoid In fact, since our whole voluntary life is selective, we all the time recognize possibilities of experience only to shun the testing of them [3]

Now the possibilities thus recognized by us—only to shun their testing and verification—are not the objects to which these possibilities make reference They are possible alternative ways of behavior between which we make a choice We now have, in a rejected alternative, a possible which is not an extended actual, nor continuous with the actual, but only a possibility. It has a status quite different from that of the center of the earth, or of the wall behind my back. These objects of possible experience are always more than mere possibilities. They are, if not actual, at least real. There are countless testings and verifications of such objects, which always remain possibilities and never become any-

[3] Royce, *World and Individual*, I, 258.

thing more Some of these possibilities of verification also become actual I mean by a transcendent possibility one which always remains just a possibility Continuous possibilities are the real, hence more than possible, objects of possible verification We have now to consider more in detail transcendent possibilities

An objective realm of transcendent possibilities does, prima facie, confront us In both practical and theoretical intercourse with our world we are constrained to take account of objective possibilities just as we are with actualities and the reals which are continuous with them Let us survey some of the inhabitants of the domain of objective possibilities I would direct attention to three kinds of possibility—the alternative, the capacity, and the tendency

We are confronted by alternatives whenever we are in a problematic situation Problematic situations are either practical or theoretical A practical problematic situation is one in which the problem takes on the form of What is to be done? *Quid faciendum?* When I wish to use my car and can't start it, I am in a problematic situation There are alternative modes of procedure I can experiment in a variety of ways with the car, or I can abandon the car, ask to borrow my neighbor's car, or call a taxi, or walk, or give up going altogether Possible, alternative modes of behavior confront me and, no matter what I do, I make a choice Ethical problems, in which there are conflicts of interests and desires, of loyalties and duties, consist of the presence in my world of competing, alternative determinations of conduct and interest My decision decrees which of these possibilities shall become actual But, prior to my decision, I am aware of and possess a knowledge of the relevant possible alternatives There is, I may note in passing, no adequate provision for this prior knowledge of possibilities in an instrumental theory of mind and of knowledge For a naturalistic, biological theory of mind, the function which mind performs is pragmatic and operational It exists in order to effect reconstructions in experience, to manipulate, contrive, and control. Intelligence arises under the stress of complex, problematic situations for which habit and routine are inadequate. Intelligence is said to be practical, and supposedly it is the vice of traditional, classical philosophy to conceive of the mind and of knowledge as a contemplative spectator. I would point out that the mind would be wholly

helpless to resolve or reconstruct a problematic situation unless it first had just such a contemplative, spectator knowledge of objective possible alternatives Before we can reconstruct our economic order intelligently we need to know, in the traditional sense of contemplative presentation, what the objective possibilities really are. Without such contemplative knowledge, mind could not perform its equally important function of guiding practice

In theoretical experience we are likewise confronted with problematic situations, containing objective, alternative possibilities A theoretical problematic situation is one in which there are competing possible alternative explanations and interpretations of given fact These possible explanations are hypotheses There are two differences between practical and theoretical problematic situations Each of several alternative scientific or theoretical hypotheses can be tested in turn, and the most adequate hypothesis selected But, in every practical choice among alternative possible actions, the decision to do this rather than that precludes the actual testing, in that unique situation, of any alternative mode of behavior Shall I boil or scramble these eggs? Either is possible, but I cannot test both possibilities in any single practical situation If I want to know whether a number is prime or not, I can test each of these two alternative possibilities

In the second place theoretical questions appear to differ from practical questions primarily in the method of their resolution, in the source of the decision decreeing which possible alternative is to be chosen It is not we who make the decision, but the evidence and the facts "Is this a dagger which I see before me?" To put this question is to be confronted by at least two alternatives each of which, prior to a decision, is possible Either it is a dagger or it is not Whether it is or is not depends on how this thing behaves when I manipulate it The alternative possibilities relevant to a theoretical question need not be explicitly formulated. How many quail are there at this moment in my garden? I cannot see and therefore cannot count them The alternative possibilities are but vaguely defined There may be none, or one or two or three—any number up to a vague limit I am quite certain that there are not a million

Alternative possibilities are not restricted with respect to their temporal reference We discover alternative possibilities in the past as well as in the present and future. Otherwise, the conditional

perfect tense would be inexplicable and meaningless The chess moves which I might have made and the one which I now see that I ought to have made instead of the one that I actually made, are alternative possibles relevant to the past Renouvier wrote a hypothetical history of Europe "not as it was but as it might have been" if the Christians had remained an Eastern sect and had not obtained political mastery of the West And Gibbon, in a famous passage, recounts the possible consequences which might have attended a Saracen victory at the Battle of Tours "Perhaps the interpretation of the Koran would now be taught in the schools of Oxford, and her pulpits might demonstrate to a circumcised people the sanctity and truth of the revelation of Mahomet" An economic depression which might have been worse and more severe than the actual depression in which we now find ourselves is an alternative possibility relevant to a present state of affairs The possible chess moves which I may make when I next play are objective possibilities relevant to the immediate future Possibilities relevant to the past and the present always remain transcendent possibilities, whereas some possibilities relevant to the future may become actual

A second type of transcendent possibility is indicated by the capacities in terms of which we describe things Cotton is inflammable, sugar is soluble dogs are teachable, and so forth Adjectives like these, formed by the suffix "ble" denote the capability or possibility of exhibiting certain characteristics under certain general, specifiable conditions This lump of sugar is soluble though it may never be actually dissolved Its solubility is just as objective a character of the sugar as its shape, size, and specific gravity Locke put his finger on such objective possibilities when he declared that "powers form a great part of our complex ideas of substances" The description of things in terms of their possibilities, their capacities, does explicitly the very thing which, as we saw above, is implied by the nature or suchness of anything, even by the apparently simple, atomic qualities such as this particular shade of green To have such and such a nature or characteristic is to be capable of other equally particular possible exemplifications Capacities denote this spread beyond the actual in a more explicit manner than do simple natures and atomic qualities

A tendency is another kind of possibility, prima facie objective

A tendency is distinguished from a capacity—not sharply—in that a capacity of anything depends for its actualization upon the positive presence of other things and outlying conditions, whereas a tendency does not Sugar is soluble Whether any bit of sugar will be actually dissolved depends upon its being immersed in a liquid. There is no tendency toward solution in the sugar itself On the contrary, a coiled spring tends to unwind For the tendency to be realized and made actual, it is only required that it be let alone What things and structures do really have tendencies, so that a negative policy of laissez faire is all that is needed to insure their fruition, is another question I suggest in passing that the modern social and economic theory of laissez faire may be in grievous error precisely because of an uncritical ascription (in Aristotelian and Scholastic fashion) of tendencies to the ingredients of social processes The history of science is, in large measure, the substitution of relational capacities for inherent tendencies.

Alternatives, capacities, and tendencies by no means exhaust the universe of possibilities There is a familiar passage in Hume's *Enquiry* which indicates how vast and apparently inexhaustible that universe is Hume is portraying what he takes to be a false and unwarranted view of the power and scope of thought

> Nothing [he says] seems more unbounded than the thought of man, which not only escapes all human power and authority, but is not even restrained within the limits of nature and reality While the body is confined to one planet, along which it creeps with pain and difficulty, the thought can in an instant transport us into the most distant regions of the universe What never was seen or heard of may yet be conceived, nor is anything beyond the power of thought, except what implies an absolute contradiction [4]

This passage is cited to bring before us the apparent correlation between the world or worlds of the possible, infinitely wealthier than the world of reality, and the function of thought as distinct from sense experience A creature endowed with sensory awareness alone, were this possible, would have no apprehension of any possibilities Its world would be limited to the present actual There would be for such a creature no alternatives, capacities, tendencies, no "might have beens," fictions, nor supposals The question concerning the nature and status of possibles is the question concerning the nature and status of objects of thought, and accordingly

[4] Hume, *Enquiry Concerning Human Understanding* (ed. Selby-Bigg), p 18.

the question concerning the office and function of reason or thought in experience The realm of the possible, thus expanded beyond alternatives, capacities, and tendencies, to include fictions and imaginary creations, David Copperfield and Timothy Forsyte, the exploits of Jack the Giant Killer, and the adventures of Alice, the pantheons and pandiablons of mythology and superstition— this appears to be a realm of possibles which are transcendent of the actual with a vengence Yet all such entities are possible, because men conceive and imagine them

Let us explore this realm and try to see what it is that sustains our human interest in the possible as anything whatever which is imaginable or conceivable I want to show that this realm is genuinely objective, and that it does not constitute a world of essence or subsistence, separate from what exists, from nature, if nature means the totality of what exists

We are not content merely to allocate all conceivable entities, all possibles, to a realm separate from the world of real and actual existence We have, rather, a profound interest in discovering the difference between two kinds of such conceivable, transcendental possibles In all the typical major forms of human experience we have a vital and persistent concern with the difference, as we are likely to say, between what is really possible and what is not really possible It will avoid confusion if I refrain from using the terms "real" and "unreal" However, the distinction here, like that between real and unreal elsewhere, is eulogistic in that it is not independent of considerations of interest and value We might, without impropriety, call the two sorts of possibles "good" and "bad" Perhaps we can best use the terms "genuine" and "spurious" I am saying that this is a distinction which falls within the very wide universe of the possible as the barely thinkable and that there are two kinds of possibles, spurious and genuine But of course a spurious possibility turns out to be not really a possibility at all It is an impossibility, and we reach the somewhat curious result that an impossibility is a certain kind of possibility.

This is not so paradoxical as it sounds, for there is a further ambiguity in the meaning of "possibility," and we have to distinguish between an unrestricted and a restricted denotation of the possible Only in the narrower sense does the possible coincide with the conceivable In its unrestricted sense, possibility means not

conceivability but, as it were, anything that is a candidate for conceivability And not all candidates pass the test Impossibility is a candidate, hence possible in the wide sense, but its candidacy is rejected and therefore it is impossible Are round squares possible? Yes and no When I ask this question, I am proposing a round square as a candidate for the status of possibility Round squares, as Alexander says, though self-contradictory and impossible can nevertheless be "entertained in thought" But as soon as the idea is entertained and proposed, it is rejected as really inconceivable As a proposal, it is a possibility As a rejected candidate it is judged to be a spurious possibility, that is, an impossibility This is a simple example No extended process is needed to test the genuineness of this possibility But mathematics is full of examples of this same general kind, differing only from the round square in the length of the interval between the proposal and the decision Is it possible to square the circle or to trisect an angle with straight edge and compass? These questions do not answer themselves immediately They have occasioned difficulty in the history of mathematics Men have tried to square the circle and to trisect an angle There is a longer interval between the proposal of these and the decision which rejects them, than there is in the consideration of round squares These are possible until they are shown to be not possible But even after their spurious possibility, their impossibility, has been demonstrated, they still retain the status of having been candidates for possibility, that is possible in the unrestricted sense

Round squares circle squaring and the like are not genuinely possible because they are internally discrepant and self-contradictory There is a second class of rejected possibles, another ground for recognizing some possible entities as spurious or impossible. There are possibilities (in the wide sense) which are rejected as spurious not because they are internally discrepant but because they do not accord with the known conditions of the real world, of the actual and the extended actual. So far as I know, there is nothing internally or logically contradictory in the notion of a perpetual motion machine Unlike a round square, it is logically possible both in the unrestricted and in the narrower sense. Yet physicists tell us that a perpetual motion machine is not genuinely possible Its impossibility arises from the fact (if it be a fact) that it is no possible determinant of any general determinable or set

of determinables which comprises the known nature of physical processes If this were all, we might hope some day to discover a set of general determinables of which a perpetual motion machine would be a determinate arrangement Such a hope seems groundless in the light of our present knowledge of the general conditions of natural processes

Thus, there are two main types of spurious possibles, two grounds for rejecting candidates for the status of genuine possibility Either the proposed possibility collapses immediately or eventually through internal contradiction, or it conflicts with some known general conditions of nature What is left are genuine or real possibilities The discovery of genuine possibilities and their discrimination from spurious possibilities is a momentous affair in human experience In such discrimination and discovery lies the essential office of reason, of thought, of intelligence Mind itself, from its very first beginnings, is elicited by the existence of real possibilities in the one world which is the habitat of mind The intelligent direction of behavior, the resolution of problematic situations, foresight, and purposive planning, hinge upon the discovery of genuine possibilities and their discrimination from spurious possibles What we most need to know in the present economic crisis are the real possibilities resident within our existing economic and social structures If the relevant possibilities are viewed as inhabiting a separate domain of subsistence, then there is nothing which men can do to alter and control the actual situation How, indeed, real possibilities exist within the one world of nature, I have presently to consider Before doing this, I shall deal briefly with two other matters

The discovery of genuine possibilities within our world is not only of supreme practical importance What appear to be aesthetic and imaginative creations of poets and novelists are, in part, the discovery of real possibilities What does Mr Galsworthy do in creating the Forsyte family? The individual, Timothy Forsyte, is indeed a fiction. His birth certificate is not recorded in Somerset House Nevertheless, I think it is wholly false and misleading to say, as Russell does in speaking of the difference between Hamlet and Napoleon,

> that it is of the very essence of fiction that only the thoughts, feelings, etc in Shakespeare and his readers are real, and that there is not, in addition to them,

an objective Hamlet. When you have taken account of all the feelings roused by Napoleon in writers and readers of history, you have not touched the actual man, but in the case of Hamlet you have come to the end of him.[5]

But I think it is nonsense to say that the existence of Hamlet is dispersed among the thoughts, feelings, and mental events of innumerable minds in the last three hundred and forty-four years. Hamlet is no more mental than was Napoleon, though Shakespeare's creation of Hamlet and the reader's appreciation of him may properly be called "mental," if anything is I agree with Stout in calling such literary fictions real possibilities Timothy Forsyte is a real possibility because his character and actions conform to the real general conditions of recent English social and economic life These general determinables are observed, discovered, contemplated, and portrayed by Mr Galsworthy Timothy Forsyte is an individual determinant of such real general determinables If the novel is true to life, there is no collision between the determinate individual men and events portrayed and any of the known general conditions and variables which quite literally exist within some specific historical culture Imaginative creation and invention here as elsewhere rest upon insight and discovery I should go even farther and say that the ridiculous creations of the exuberant fancy of Mr Wodehouse, or the Yankee in King Arthur's Court, or the incredible exploits of the creatures of myth and fairyland, all rest upon *some* general known conditions of nature and experience The general determinables with which they collide, which make them as a whole impossible, are simply left out of account There is always some discoverable general feature of our world, some existing universal, I should say, which makes possible the wildest creations of imagination and fancy In this respect they are all really possible They are seen to be spurious possibles, impossibles, only when all the known general conditions of nature are taken into account. Practical experience differs from aesthetic experience in that it requires a consideration and knowledge of the entire range of relevant general conditions

Secondly, I would observe that the distinction between spurious and genuine possibles is not epistemic This marks its radical difference from the distinction between the actual and an object of possible experience It is our perspective, our observing or fail-

[5] Russell, *Mathematical Philosophy*, p. 169.

ure to observe, upon which depends the boundary between the actual and the continuous possible. But no alteration of our perspective, nothing that we can do, affects the boundary between spurious and genuine possibles, between the impossible and the possible We discover what is really possible, its existence does not wait upon our knowledge The framework of the possible is set for us and not by us Within that framework we act and choose, imagine and conceive, invent and create The question I would now ask is, What makes possible the distinction between spurious and genuine possibles, between the impossible and the possible? What makes genuine possibilities possible?

I shall outline my answer to this question through a brief consideration of certain types of philosophical analysis which preclude any such discrimination, and therefore any discovery and knowledge of the genuinely possible I am willing to make this the test of the adequacy of a philosophical theory Can you show how, in terms of your theory the distinction between the impossible and the possible—and this means the discovery of the genuinely possible—is plausible and significant? I say this because in the discovery of the possible there is compressed pretty much the whole venture of mind and of human experience

There are two contrasted types of philosophy, both of which make implausible and impossible any distinction between spurious and genuine possibles Hume and Bergson may serve as examples of one type, Bradley and Bosanquet as examples of the other According to Hume, the contrary of any matter of fact is always possible It is really possible for the fire burning in my hearth to congeal me instead of warming me There is no knowledge of any general conditions, determinables, and structures in nature which precludes this as a spurious possibility If we rule out this and its kind as highly improbable and guide our actions accordingly, it is not because of any rational or cognitive insight into the connections and relatedness of events within a system, but solely because of an irrational and instinctive propensity, necessary for life but without reasonable or theoretical warrant. Now I submit that where anything whatever is possible, nothing is really or genuinely possible Unless there is some ground for distinguishing what is really possible from spurious possibilities, it is meaningless to say that *this* and not *that* is possible But, as we have seen, this is

just what we need to know if intelligent practice is possible The search for the really possible implies the rejection of all sorts of merely conceivable possibles as spurious and impossible Is the Russian economic system possible for us in America? It is conceivable, no internal contradictions need be present Whether it is or is not really possible depends upon what we know about the dominant scheme or structure within our economic life, and whether the specific Russian plan is a determinate individual concretion of such general determinables as are actually found to exist in our situation For Hume, anything whatever is possible, or (what amounts to the same thing) nothing is genuinely possible, because of his nominalism He denies knowledge of anything in nature except particular, actual or real, entities He denies the existence of general, pervasive recurrent patterns, types, rhythms For him, reason and thought do no more than provide pale replicas of particular impressions They yield no insight into the general structure of things

Bergson is a Hume who takes time seriously Like Hume, Bergson refuses to accord to reason and thought any theoretical insight into the general patterns and structures of reality The creative advance of duration moves within no formal organized structures There are no known general, relational patterns which provide the framework of concrete events There is no knowledge, no cognitive discovery of recurrent types, forms, schemata of organization, within which moves the creative impulsion of nature From each actual living present, there is a blind, unpredictable, forward thrust, a creative leap in the dark unconstrained by any formal, general, intelligible structure A mind devoted solely and purely to knowledge, uncontaminated by any practical necessities of acting, of choosing and controlling things, would be wholly absorbed in the actual. Unlike Hume's actual, that of Bergson is not punctual, atomic, and nontemporal The present actual is a duration penetrated by the past which is literally carried along in and by the present The entire content and wealth of the real is packed within the present actual and its creative advance into novelty. What is it, then, that leads or misleads the mind to entertain the notion of anything nonactual, ranging from the possible to non-being? Bergson tells us that all the major difficulties and problems of philosophy arise from the fact that the schemata necessary for human

action adventure beyond their proper domain The necessities of action and control breed concepts and habits of thought which intrude into, infect, and falsify our cognitive and theoretical apprehension of reality The requirements of practical action invoke and imply the notion of something nonactual, of nothing, and of the limbo of the possible, suspended halfway between nothing and existence When theoretical insight is purified and made immune from such contamination, nothing remains but the actual Bergson is true to the spirit of Positivism in this polemic against any species whatever of the nonactual He differs from the scientific Positivism of Mach and Schlick, and from the positivistic wing of the neo-Kantian movement in making the notion of the possible, the nonactual, spring, not from the accidental shortcomings of our observation and knowledge, but from the illegitimate intrusion of practical concepts into the domain of knowledge and intuition

The result is that for Bergson, as for Hume, there can be no discrimination between spurious possibilities and genuine possibilities, that is to say, between the impossible and the possible. For Bergson, as for Hume, nothing is really possible because, viewed in the light of what we may know, anything and everything are possible For both Hume and Bergson, we possess no knowledge of structures, forms, recurrent schemata, relational systems which indubitably belong to the real no less than do atomic impressions or creative, present durations A denial of such forms and structures is the one characteristic earmark of all degrees and varieties of nominalism

Does real possibility, distinguishable from spurious possibility or impossibility, fare any better in the type of philosophy represented by Bradley or Bosanquet? I do not think that it does Here, the ground upon which real possibility is, in the end, excluded, is not that there are no recognizable structures and patterns in the world, apprehended by thought, but that ultimately there is nothing else The real universal is concrete and not abstract. Possibility is a species of necessity The real absorbs the possible. Concrete, particular specifications and details flow from and are determined by the universal which pervades them In the concrete universal, the true individual, the universal is exhaustively displayed without remainder in the total spread of its particular manifestations There can be in the Absolute no possible exempli-

fications of the universal other than those which do comprise the actual, necessary contents and life of the Absolute

Bradley has made explicit denial of the existence of the abstract universal "The abstract universal and the abstract particular are what does not exist . what is real is the individual the abstract universal is a mental creation, not a fact outside our heads "[6] That is to say the concept of possibility reflects only our ignorance. It is not only not constitutive not a bona fide metaphysical concept; it is not even epistemic To characterize its status, one would have to invent a term which is related to "ignorance" as "epistemic" is related to the requirements and necessities of our knowledge Bosanquet puts it without ambiguity

> Possibility results in referring to reality, without transition, but subject to an estimate, what is only connected with it by transitions. When the whole transition is made explicit, the allegation of possibility is superseded The judgment which has all its conditions and reservations fully assigned to it is of the apodeictic order, possibility arises from effecting the reference to reality apart from the conditions The idea of "possibility" is our substitute for the omitted conditions. Obviously, such an idea may emanate from all degrees of confused perception or of reflection [7]

Now I am far from thinking that there is nothing to be said for the kind of thing which, in Hegelian terminology has been named or rather misnamed the "concrete universal" The concrete organized structures and processes of nature, life, and mind exhibit an endless variety This variety is in part describable in terms of the relative looseness or compactness between the universal dominant scheme, the relational pattern on the one hand, and the particular empirical details, the factual content on the other hand Our world contains both machines and symphonies, space-time patterns and the Platonic Form of the Good All forms, principles of organization, all universals are abstract even those discoverable within the most concrete and individual structures There is always that is, some gap, not only for our knowledge or ignorance, but within nature or reality between any schemata and its empirical detail. The latter is always, in some measure, contingent This is, I take it, the meaning of Whitehead's description of every actuality, every actual occasion, as a "decision" Decision is in its root meaning a "cutting off," an exclusion of alternative actualizations within the

[6] Bradley, *Logic*, I, 188. [7] Bosanquet, *Logic*, I, 373

framework of the possible Such a framework is always present. It is no artifact, no consequence of ignorance, nor is it to be superseded at any more adequate level of knowledge The question, What makes possibility possible? is the question, What makes it possible to distinguish between spurious and genuine possibles, between the impossible and the possible? In what sort of world is it possible to discover real possibilities? That kind of world, I have suggested, lies somewhere between the worlds of Hume and Bergson and the Hegelian world of Bradley and Bosanquet, defined ultimately in terms of the concrete universal It will be a world in which there are types, kinds, relational structures, forms, and universals It will be a world in which such general determinables have possible occurrences as well as actual occurrences The existence of such possible occurrences is the existence of those more general structures It will be a world whose factual details are made intelligible by the more general patterns and forms which they exemplify, but which are not deducible, without remainder, from such general structures It will be a world of which the theoretical grasp and knowledge and practical mastery require the presence and the activity of ideas, of thought, and of reason It will be a world the very first impact of which upon any sensitive thing or organism implies and entails the thought of that which transcends the immediately delivered content It will be a world in which the function of reason, implicitly present in the simplest sensory response, is none other than a disclosure of objective possibilities For as Kemp Smith, to whom much of my discussion is greatly indebted, has remarked, it is "with the possible that reason, *qua* reason, is primarily concerned"

Is such an account as this adequate to the inexhaustible range of objects of thought, of possibles in the unrestricted sense, including contradictions and the creations of fancy and imagination as well? Can such an account do justice to what Alexander has described as the "liberty of the mind, released from the control established in sense by things"? This question is answered in the negative by all those who lodge possibilities, together with all objects of thought, supposition, and imagination in a separate domain of subsistent nonexistence. They are made to inhabit a literal no-place, a utopia With reference to all such types of subsistent realism, I shall limit myself to one comment I should like to place the mo-

tives—and they are urgent ones—which lead to such an extrusion of objects of thought from the actual and the real alongside of those motives which have led to the expulsion from nature of secondary qualities It is quite clear that nature was not described exclusively in terms of extension, of primary qualities, because secondary qualities had first been authenticated as mental and subjective It was the other way around Secondary qualities were voted out of nature because there was no place for them in nature as described and interpreted in a certain way in terms of mechanistic naturalism The traditional dualism of primary and secondary qualities, of nature and mind holds out now a challenge and a problem Are there any equally or more adequate alternative interpretations of nature which find a legitimate place in nature for secondary qualities? Perhaps the expulsion of secondary qualities from nature is a dodge necessitated by an attractive and relatively simple description The lure of theoretical simplicity may mask objective complexities Can we formulate a description of nature as overlapping and including secondary qualities? I know of no such completely adequate description, but I think that those who are searching for one are on the right track I will leave it to the reader to carry over the analogy from this affair of primary and secondary qualities to the question of the relation between the objects of sense experience—the actual and the continuously expanded actual—and objects of thought, possibilities Any description of the real, of the world of objects of actual and possible experience, which banishes objects of thought to a separate domain is, at best, a challenge It stimulates doubt such an interpretation may be altogether too simple Transcendent possibles, alternatives, capacities, and tendencies, of which *all* the exemplifications may, yes, *can,* never be actual, are nevertheless discovered by mind, by thought and ideas, within the one world which comprises the habitat of our minds, the one inexhaustible domain of our knowing, our appreciation, and our doing.

POSSIBILITY AND IDENTITY

BY

RALPH W. CHURCH

POSSIBILITY AND IDENTITY

RALPH W CHURCH

WHEN A MAN says to himself, "Anything is possible," he then uses "possible" to mean what is meant by "conceivable" In this sense of the term, it is not possible that a child today enjoying his tenth birthday should tomorrow die of old age, whereas it is possible that peace should some day reign on earth This sense of the term may be called that of the gratuitously possible, it is the sense in which a man is free to make statements wherein subject and predicate are compatible, or to imagine whatever may occur to him If such irresponsible mental activities are sometimes more than futile, that would seem to be because, in their occurrence, they suggest further possibilities which are not merely gratuitous, but which might be actualized The return of a monarchy is possible both in France and in Germany, not simply in the sense that this is conceivable, but in the sense that, if certain conditions were fulfilled, such would be the government in both countries The gratuitously possible raises no question of what might or might not come to pass, like the liberty of indifference, it is fatuously sufficient unto itself Genuine, or real possibilities, on the contrary, are such as comprehend not what is conceivable merely, but what conceivably can happen

The question, then, about the nature of possibility would seem to be, What is the import of judgments that express beliefs concerning what can happen? It is surely true that an essay on possibility which ignored the problematic judgment, would be in that respect barren for logical theory. It is not however clear that an attempt which should concentrate exclusively on the meaning of the modal judgment, "A may be B," could fail to ignore a consideration fundamental to any theory about the problematic judgment, that is, the status of what is possible. If the judgment, "English currency may depreciate further in value," is not identical with the possibility of the pound being further depreciated in value, then no account of the problematic judgment can be a theory

about possibility We are, then, faced with two distinct questions, one concerning the nature of the modal judgment, "A may be B," and the other concerning the status of what may be The second would seem to be fundamental to the first Without an articulated view of the term "possibility" as the proper or improper name of something real to which problematic judgments can refer, it would be presumptuous to look for any genuine import in the problematic judgment at all Yet, since an adumbration of what I take to be the character of the modal form called the problematic is the best preface I can manage to what I wish to say about the nature of possibility, so far as that is the condition of genuine problematic judgments I shall be guilty of that presumption

I shall begin, then, by asking what meaning is to be assigned in logical theory to the predicate, "possible" I shall then urge that being repeatable is the possible so far as that is the presupposition of the genuineness of modal judgments of the form, "A may be B," and I shall attempt to give reasons for rejecting certain views to the contrary Finally, I shall urge that the predicate "possible" is not the proper name of any generic or specific sort of reality, that it means what is meant by qualities and relations being intrinsically individuated and self-identical and therefore repeatable

To ask what meaning is to be assigned to the predicate "possible" in the not gratuitous but rather genuine and responsible use of that term, is to inquire about the sense in which the predicate "possible" can mean what is meant by "what can happen" Plainly, not "what is happening," nor "what must happen" The assertoric judgment, as Joseph has pointed out, may be either unreflective or reflective If the former, it expresses the content of a consciousness which at that moment is unmediated by conscious memory, reflection, or doubt Such assertoric judgments express an attitude of primitive credulity or mere animal faith, they are limited to the obvious, and exemplified in what Johnson calls primitive propositions The reflective form, if not itself always mediated, is at least always consciously accompanied by reflection and doubt, and thus may be asserted with some awareness of its own assumptions In reflection on and doubt of those assumptions questions are tentative concerning why the datum must be so, or concerning how such things can happen Should the datum be a triangular object, the necessity that it have three angles would of course be internal to the form

of the object, whereas the necessity that my eyes should ache would of course be external to that discomfort In this second sense of the term, and if the law of causality holds, whatever exists is necessary And if the existent is the actual, it would seem to follow that in existence there can be no distinction between the actual and the necessary, and no place for the possible I shall later on urge that this, if used in the attempt to denote specific sorts of reality, is in one sense true of the terms "actual" and "possible" But with respect to their use in the modal forms of judgment it is not, I think, true at all One may be impelled by the obvious to assert its existence, while at the same time making consciously no assumptions at all about the conditions of that existence Again, in the reflective assertoric judgment, uttered in spite of no matter how many tentative or definite questions about its grounds, there still is the presented object of the judgment, distinct both from questions about its grounds and the grounds themselves There is then an epistemic distinction between the actual as this experience of mine, and the actual as what exists in any other connection whatsoever Thus the assertoric judgment is concerned with the effect of a causal system, and not at all with the necessity or non-necessity that certain causes should have this effect The apodeictic judgment, on the contrary, intends to assert that A must be B either in virtue of the character of A alone, or because the ground of the necessity external to A and B is apprehended

The genuinely possible, it has been suggested, is what can happen It is, then, what would happen necessarily were the sufficient conditions fulfilled As distinguished from its gratuitous contrary, the genuinely possible is whatever is assumed to be the consequence of particular conditions Certain political and economic conditions being given, the return of a monarchy in France is possible But in asserting this, we do not mean to assert that all the conditions exist And that is the difference between the categorically apodeictic and the genuinely problematic forms. In the apodeictic form we take it that we know what the sufficient conditions are, and we affirm their existence The problematic form requires that the conditions of A's necessarily being B should all be assumed, it does not require that the existence of all should be affirmed If no conditions alleged to be those of A's being B are assumed, the possibility asserted is gratuitous merely Hence, the

assumed basis in fact may vary to any extent between the vanishing points of the gratuitously possible and the categorically apodeictic "A is B" is possible in the vaguest sense when the judgment means that such is not known to be impossible Again, "A is B" is possible in the most knowledgeable sense when the particular conditions which would make it necessary are apprehended, and some of these, but not all, are assumed to exist

If the foregoing commonplace remarks have at all served their purpose, they will have suggested that the modal words do not denote different ways in which A is B Since "actually running," "necessarily running," and "possibly running' are not three kinds of running, it is clear that in the corresponding modal forms we have not three judgments all with the same subject, "he " The modality of a judgment cannot, then, qualify its predicate Again, since my judging "A may be B" is, as an act of thought, itself actual, the modal term "possible ' cannot qualify the act of judging But cannot these terms qualify the subject of the judgment? Here again the answer must be negative, for "that horse is actually deaf" and "that horse is possibly deaf" do not state different ways in which a horse can be deaf

But if the modal terms cannot qualify the predicate of judgment, the act of judging, or the subject of the judgment, what can they qualify or distinguish? The alternative remaining would seem to be that they qualify the processes of thought which culminate respectively in the judgments "A is B," "A must be B," and "A may be B " Since it is a commonplace that we often make statements without actually thinking what we assert (as when a man recalls and recites the multiplication table), it will be obvious that I am concerned here, not with the modal forms of statements, but with the modal forms of thoughts If a man entertains a certain thought, his act of so thinking is of course actual, my suggestion here is not that the modal terms qualify the activity of thinking as such The naive form of the assertoric expresses a felt conviction not questioned by reflection, whereas the reflective form asserts a conviction despite doubts to the contrary. The assertor would insist, rightly or wrongly, that in either form he is expressing in judgment what he observes or notices Knowledge is likewise supposedly present in judgments asserting internal or analytic necessity. In both modal forms the existence of knowledge is presumed;

but not knowledge arrived at by the same processes The judgment, "This room is lighted," is (to use Johnson's language) experientially certified, the certainty thus expressed is of the force and pungency of my observation of the present moment; whereas the judgment, "This triangular figure must have three angles," is formally certified by the reflection that the given figure could not be qualified otherwise The scope of these two modes of certification is notoriously a matter of controversy Some philosophers maintain that the principles and formulas of logic and arithmetic are certified by thought alone, while others hold that the principles of geometry can be certified only in and through sense-perception. Again, there are differences in theory about the range of the experientially certified It is held that experience can certify only judgments about the data of the moment of assertion This may be extended so as to comprehend memory-judgments about the subject's own past, or still farther to include observations of physical, and judgments about mental, phenomena But if a rigorous line between the two modes of certification cannot be drawn, the relation between them may nevertheless be pointed out What is formally certified is what is certified by reason without appeal to sense-perception, though, of course, not without the aid of memory On the contrary, what is experientially certified is what cannot be certified without the help of experience, not what is certified by experience alone

Apodeictic judgments asserting mediated necessity may be either formally or experientially certified When the premises of the deduction are formally certified, the conclusion is certified likewise, when, on the contrary, one premise is experientially certified, the certainty of the conclusion is experiential. Of course, such judgments are often invalid on formal counts, or are false because of the falsity of the experiential premise or premises But where apodeictic judgments about matters of fact depend on experiential premises which are doubtful, there is then the problematic or uncertified modal form. It has been pointed out that such judgments are problematic in the poorest sense when what they assert is merely not known to be inconceivable, and in the most informed sense when the sufficient conditions of the existence of the thing under consideration are known, though not all the conditions are known to exist

But if the modal predicates "actual" and "necessary" qualify modes of certification, and if the term "possible" qualifies judgments which to some extent are uncertified, does this mean that possibility is identical with uncertainty? This privative sense of the term is I think, the correct one with respect to its function as a modal predicate For an omniscient mind, nothing could in this sense ever be possible Yet there remains the further sense in which what is possible is what can happen To fix the meaning of the term "possible" with respect to its use in the formal theory of judgment is plainly not to say anything about its meaning with reference to the objects of problematic judgments And since problematic judgments are not themselves about the uncertainty they express, we must now ask about that to which such judgments can refer

It would seem at first glance that "A may be B" can refer to all qualities and relations that are in any respect compatible or compossible, and that consequently, there can be little more to the matter now under discussion It may be suspected however, that even in this form the matter is not quite so simple A quality or a relation might be compossible with other relations or qualities and yet itself be unique But what is unique cannot be the object of a problematic judgment This is not to deny that unique things can happen, it is rather to assert that only what is in part repeatable can in any respect be anticipated in judgment Since a unique real can by definition be experienced but once, it therefore cannot be repeated even in the most capable imagination But that I may judge that A may be B, I must have previous experience of A and B, or of something like them, otherwise I could make no relevant judgments about them at all Were A and B unique, were they in every respect unmatched, my first acquaintance with them could only be my last For I could not even in imagination anticipate the repetition of A's being B

The postulate of the problematic judgment, even in its least informed sense, is, then, that at least some qualities and relations are repeatable To this it will be objected at once (I suppose) that it is a commonplace of experience as well as a consequence of much valid reasoning that no things and no relations ever are repeated I think it may be answered that exact repetition of things is not in question No more is the repetition of the individuality of a thing There cannot, of course, be two pencils which are my one

individual pencil here and now, nor can this pencil now mine be other pencils to any number at all Nevertheless, some at least of the qualities of this pencil would seem to be repeatable, as would also seem to be some at least of the relations in which it now stands. To deny this, is to affirm that my pencil is unique in every respect; or, in other words, that my pencil is alone and wholly unmatched. For this there is (as I shall urge) in fact no evidence, and a priori no reason in fact things having qualities in common with my pencil are to be found, and before the fact there is no reason why many such should not be discovered Thus pencil now mine may have (and, as I should think, has) qualities that are unique; but that the manufacture of another such thing is a genuine possibility means not that a pencil in every respect identical with this one may be made, but rather that another thing such that its makers could identify it as a pencil of their make may be made My contention is, then, that one requirement of there being genuine problematic judgments is not that things be repeated exactly, but that at least some qualities and relations be repeatable A given thing may be unique in several respects If, however, those qualities of it which are its distinguishing because habitually discriminated characteristics are not unique, then in those respects the thing may be repeated Hence the judgment that another such thing can happen is a judgment about a genuine possibility

That there are things which have qualities in common with my pencil will be rejected by some as a thoughtless dogma A man asserting that he is awake is of course dogmatic, and all his deliberate thinking and acting supposes the truth of that dogma But a man who, even in his dreams, notices no difference between two appearances, is not being dogmatic in finding the two appearances the same In other words, I think it a truism that *what appears the same is the same in appearance* Here it will perhaps be objected that if this seems a truism, that is so only in the light of pre-critical thinking. For the alleged truism, it will be urged, assumes that qualities are given to the mind and passively received by it And this objection would be supported, I suppose, by at least two lines of argument On the first of these, it would be contended that in the very nature of the case nothing can be given. What we apprehend is never a bare quality in isolation, but always a quality in relations Thus a man may not perceive pale yellow, he must

perceive a patch having that color, *and* a shape *and* spatial relations as well But in apprehending the patch as having these qualities and relations a man is not simply receiving something given; he is actively judging and, as a result, making the so-called "given."

Now, were it necessary for the purposes of this essay to hold that experiences are merely or simply given, this argument would (I should *think*) settle the matter For it does show that nothing can be said to stand to the mind *merely* in the relation of being given · but it does not show that experience cannot stand to the mind in that relation among others [1]

The second line of argument would contend that nothing can be given because all experience is the product of interpretation This work of interpretation is of two kinds the associating of ideas, and *thinking* With regard to the view that because of the operation of association in consciousness nothing can be given, it has often been pointed out that there can be nothing to which associations may accrue, with the consequence that the distinction between what is caused by association and what is not so caused, loses all meaning This is, to be sure, a difficulty in the way of those who, while denying that anything can be given persist in *making* statements which imply the distinction which their denial of the given obliterates But even though this difficulty were accepted as being fatal to that denial still we should not for all that be able in any given problem to apply the distinction and simply point to what is given and what is caused by association It ought rather to be pointed out, perhaps that even though a certain recollection (say) is altogether a product of association this means not that this product cannot be given but only that as such it cannot stand to the mind in the relation merely of being given

The arguments for the view that the datum is essentially the work of thought are various, but the gist of what is perhaps the strongest of them may be stated in this way. Experience is judgment The very process of judgment alters what is judged. The initial material of this process cannot then be identical with the product There can therefore be no given, even the analytic judgments of sense are synthetic. Now, among other things, this means that if I make the judgment that the date of Governor Roosevelt's

[1] Compare H H Price, *Perception*, Chap I.

inauguration is March 4, 1933, it follows that the date which I then have in mind cannot be the date which I then have in mind And that is absurd It is true, I suppose, that experience is made, that it has causes Yet from this it follows not that the effect cannot be given, but rather that such a gift, like any other without a giver, would be the miracle of a mere impression If judgment is a process which produces a product, then we know the product to be not given merely, we do not know that the product is not given at all

The view that thought alters its subject is, in what is perhaps its most conspicuous British form, the doctrine that relations are internal On this doctrine, with perhaps the exceptions which are scarcely consistent with it of "the this" and "the mine," there is no moment of immediacy that is not also a moment of mediation From this the conclusion has sometimes been drawn that nothing is given, and in reply it has been pointed out that, even on the doctrine here discussed, there still is immediacy to a degree, and therefore givenness In the moment of the union of differences which is the consummation of judgment there is within the judgment immediacy; and in that very immediacy, itself the product of the process, the judgment is given

If it may be concluded that the arguments which have just been considered succeed, not in denying the given altogether but only in denying that what appears can stand to the mind in that relation alone, it may then be urged that appearances are given, though not given merely Yet, even so, the fact remains that the internality of relations involves the proposition that identity implies qualitative difference Hence, if the doctrine that relations are internal is true, the proposition, "What appears the same is the same in appearance," is false But before considering this comprehensive denial of absolute identity to quality and relation, I wish to consider objections of another sort to the view that qualities and relations are repeatable, for these objections also, I think, can only be made to hold on the ground that relations are internal.

William James says, in his *Psychology:*

> Every thought we have of a given fact is, strictly speaking, unique, and only bears a resemblance of kind with our other thoughts of the same fact. When the identical fact recurs, we must think of it in a fresh manner, see it under a somewhat different angle, apprehend it in different relations from those in which it last appeared And the thought by which we cognize it is the thought

of it-in-those-relations, a thought suffused with the consciousness of all that dim context [2]

It seems that this passage in part or as a whole can be interpreted so as to have four different meanings, three of which deny that qualities and relations are repeatable (1) Every thought is an individual existent, unique in its individuality and in certain of its qualities and relations which are due in part to its being fresh in the mind, and in part to its present context Nevertheless, any thought may bear a resemblance of kind to other thoughts (2) When James uses the phrase, 'resemblance of kind," and says, "the identical fact recurs," he means neither that some thoughts do resemble one another, nor that an identical fact recurs, for the whole passage shows that literal resemblance and absolute identity are not being discussed What is being discussed is resemblance and identity in the sense of "strands" passing continuously from one context into another (3) That "Every thought we have of a given fact is, strictly speaking, unique ," because every thought, being an existent, is as such unique (4) That every thought is unique in virtue of its context, which determines the character of the thought and is always wholly different from any context past

With respect to the first of these interpretations, it may be said at once that since it acknowledges that thoughts may resemble one another, it admits that some qualities and relations are repeatable In any experience there may be much that is unique and therefore not the object of a problematic judgment Since, however, my contention is not that things must in every respect be repeatable in order that problematic judgments may have a proper object, but rather that what of a thing is repeatable is the proper object of such judgments, the admission that some qualities and relations are repeatable is therefore enough for the purposes of this essay

The second interpretation seems at the least to assert one of two things either the "strand" which is the identity or resemblance continuous throughout different contexts is in some respect identical in all those contexts, or else in each one of the contexts there is a quite different "strand" If the resemblance asserted is that of an identity continuous through differences, there then is at least a quality or a relation that is being repeated in those differences, and thus it

[2] I, 233

is not denied that some qualities and relations are repeatable But if resemblance or identity is asserted of a "strand" that in every context is quite different, this is of course to deny repetition altogether But I can only confess that such an assertion baffles my understanding completely Since, *ex hypothesi*, the "strand" is in each context quite different, I am unable to understand how these quite different "strands" can properly be called *the* "strand," or how these wholly different "strands" are to be thought of as continuous

The third and fourth interpretations of the quotation from James likewise deny that any quality or relation is repeatable, and their truth depends on the alleged truth of the doctrine that relations are internal The third is that every experience is unique in virtue of its very existence Time being irreversible, no existent as such can be repeated, hence, every existent is unique. This is, I should think, in a sense very likely true But unless time or duration is internal to qualities and relations in the sense that a difference in time alters necessarily what exists at that time completely, from the premise that every moment of duration is unique, it does not follow that qualities and relations are unique. For though no moment of duration can recur, if the present moment of duration is not internal to what now endures, that "what" in all its complicated qualities and relations may be repeatable The question here then would seem to be whether existence is or is not internal to essence, whether or not, that is, the very existence of a quality (say) determines completely the character of that quality. For only if so much as this is in question can there be any point in urging that, simply in virtue of their existence, qualities and relations are unique

The internality of relations is also at the basis of the fourth of the interpretations If every bit of experience is determined in kind by its context, then any alteration in context must make a difference in experience By hypothesis, this proposition holds of all experience, with the consequence that no matter what experience is unmatched.

If we are not then to agree with Bradley that the possible is "nowhere at all outside of the heads of men," we must ask about the alleged internality of relations Professor G E Moore has, I think, shown that all relations are not internal in the sense re-

quired by Bradley's metaphysic But since there is still so much difference of opinion on the question, an attempt to go into the matter again would seem to be required

Bradley's argument[3] is regarded in some quarters as demonstrating relations to be internal in the sense that any alteration in either term must make a qualitative difference in the relation and its other term Before beginning to ask about the validity of this conclusion, I must refer to the method by which it has been reached The hypothesis of separate relations is advanced as a possible way out of the dilemma of predication It is pointed out that to say, "A is B," is either to say nothing significant, or to say that A is what it is not, and that this is no less true of "A is in relation with B" The notion of independent relations fails to resolve this dilemma But, along with that failure, we gain an insight into the matter which does enable us to see the way to what is alleged to be a proper solution Since the one attempt to regard a relation as being an attribute of its terms and the other attempt to regard it as being wholly separate from them both fail, we are driven to see that "A relation between A and B implies really a substantial foundation within them"[4] Whether by this "substantial foundation" is or is not meant the absolute reality alleged to be the identity in all differences is not a question to be raised at this point Here I wish to direct attention to Bradley's saying that the being of a relation *implies* this internal foundation in quality And he writes later "A relation *must* at both ends affect and pass into the being of its terms"[5] Thus, as opposed to the notion of them as separate, internal relations *imply* qualities and so imply them that any alteration in relation or quality makes a difference which affects the character of the relation and the quality thus altered

The conclusion that relations are internal is thus reached by the method of excluding what are taken to be the only other alternatives There can be no significance in attributing "in relation with B" to "A," if A is identical with its attribute; yet, if A is different therefrom, then in the attribution there is alleged to be contradiction The alternative that "being in relation with B" may be separate from "A," defeats its purpose For on it, the question remains and forever repeats itself, What relates the separate attri-

[3] *Appearance and Reality*, p 18

[4] *Op cit*, p 22

[5] *Op cit*, p 322 Italics mine

bute to its subject? Only one alternative remains "A is in relation with B" means neither that A is identical with, nor separate from "in relation with B", it means rather that both A and B must stand to each other in a relation which affects their character as qualities.

With Bradley we must (I think) agree that "a relation standing alongside of its terms is a delusion"[6] It must then be agreed that separate relations are impossible, and that, consequently, relations are internal in some sense of that metaphorical term I have suggested that by an internal relation is ordinarily meant a relation which *must* make, which implies, a difference in its terms. But since a difference may be either qualitative or numerical, it remains to ask whether to agree that separate relations are impossible, does or does not oblige us to agree that all relations are internal in the sense that any alteration in a relation must make a qualitative difference in its terms There can, it would seem, be little doubt that Bradley held this to be true of all relations And, if there were but the two alternatives, either that relations are separate, or that relations must make a qualitative difference in what they relate, then, having agreed to the exclusion of the first, we should be obliged to adopt the second Since, however, a third alternative remains, we are not so constrained We must agree that a relation may no more exist without any terms whatever, than that an actual husband can exist without a wife A relation, to be at all, implies terms, so that, since separate relations are such that *ex hypothesi* they imply no qualities whatever, we must agree that such relations are not possible Yet from this exclusion of the possibility of separate relations it follows that every relation implies qualities; not that relations are internal in the sense that their being altered would necessarily make a qualitative difference in their terms In order that this should follow, the possibility of numerical difference must be excluded along with the possibility of separate relations, or, in other words, it must be true that all difference is difference in quality. *If* all difference is qualitative, then to alter a relation would of course be to make a qualitative difference in its terms But, as far as the demonstrated exclusion of separate relations goes, that all difference is difference in quality, remains an assumption The false notion of external relations excluded, there remains not solely the alternative that all relations are and that

[6] *Op cit*, p 18

they imply terms different in quality, there is still the alternative that some relations are and that they imply terms numerically different. On this alternative, it would be true that any alteration in either quality or relation must make a difference that is numerical, but not necessarily a difference which is also qualitative

The advocate of Bradley's view of relations would, perhaps, deny that there is here an alternative to be considered And even though there were he might add this alternative of numerical difference is real only on the assumption that the argument on page 18 is Bradley's full demonstration of the internality of relations Yet any such assumption would ignore his having made plain in Chapter III that qualities imply relations—"relations" in the sense that they alone differentiate qualities Thus, in the chapter entitled "Relation and Quality," it is pointed out that relations and qualities are not found apart in fact and that as for qualities and relations taken in abstraction since no abstraction can either be produced, or sustained apart from the process by which it is made, this product cannot be separated from the process by which it is produced It is therefore plain that no relation and no quality stands alone In fact, relation is found always with quality, and quality with relation, and, in abstraction, the relational process by which relations and qualities are made abstract no more can be separated from the product than the product can be separated from that process This much, however, is not to be taken as demonstrating that an alteration in any relation found in fact or taken in abstraction must generate in the fact or in the abstraction a difference that is qualitative It may still be that this difference might be numerical Nor does the argument up to this point demonstrate that an alteration in a process must make a qualitative difference in the product But Bradley now goes on to urge that mere separateness, or otherness, is not possible, where there is separation there is difference, and difference, to be at all, must be difference in quality

> **I rest my argument [he says] upon this, that if there are no differences, there are no qualities, since all must fall into one But, if there is any difference, then that implies a relation. Without a relation it has no meaning. And this is the point on which all seems to turn. Is it possible to think of qualities without thinking of distinct characters?**[7]

[7] *Op cit*, p 25

Bradley's answer to this question is of course negative That qualities may be many, they must be distinct, and this distinctness cannot be difference that is numerical merely.

> For consider, the qualities A and B are to be different from each other, and, if so, that difference must fall somewhere If it falls, in any degree or to any extent outside A and B, we have relation at once But, on the other hand, how can difference and otherness fall inside? If we have in A any such otherness, then inside A we must distinguish its own quality and its otherness [8]

The difference, in virtue of which A is one of many qualities, cannot fall within the character of A, for were it within A, there then would be an infinite regress in differences within A itself The difference, then, must fall outside A And on the assumption that "difference" is a relation, this means that A, in virtue of its difference from other qualities, is by that very difference related to them.

Yet, even so, it still must be asked, "Is this difference necessarily qualitative? Clearly, that qualities may be many, they must be in some sense different This difference "must fall somewhere", and it must "fall" either "inside" or "outside" A The difference cannot fall inside A, for that would differentiate A within itself, into A_1 and A_2, and, since this is a question of principle, A_1 and A_2 would be differentiated indefinitely within themselves The difference must then fall "outside A", and thus "we have relation at once" On the assumption that difference is a relation, this argument, it would seem, does demonstrate many qualities without any relations to be inconceivable Here, then, Bradley makes plain that qualities must be in relation that they may be distinct, as before this, on page 18, he demonstrates that relations must have qualities. Yet, even though we take the demonstration that relation implies quality, together with the further argument that distinct qualities imply relation, still we fall short of the conclusion that relations must make a difference in their terms that is qualitative, and that the character of a quality must determine the character of the relation in which it stands Although it is plain that relation without terms is a delusion, and though it be true that qualities without relation are nothing, still it does not follow from this that any alteration in a relation must make a qualitative difference in its terms, nor that any change in a quality must make a qualitative difference in its relations From the two premises given, this conclu-

[8] *Op cit*, p. 24

sion follows only in virtue of a further premise, namely, that to be different is to be different in quality. Yet neither the exclusion of the alternative of separate relations, nor the exclusion of that of quality without relation, implies this third premise It still remains an open alternative that some difference be numerical

We must, then, look elsewhere in *Appearance and Reality* to find it established that all difference is difference in quality So far as the two chapters which have been referred to are concerned with the logicality of judgment or prediction, their argument does foreshadow the gist of "Note A," but at the same time this adumbration is foreshortened out of proportion by its context For this reason, I propose to consider "Note A" as affording a proper statement of Bradley's view of predication—a theory which does imply that difference is difference in quality

In thinking, if we would have more than mere association of ideas, there must be in some sense the assertion of "unity" in "diversity" Differences in no sense united are merely different; and, on the contrary it is an old story that the formula of thought cannot be "A is A" Yet the requirement that thought must unite differences is not easy to meet If the formula of thought cannot be "A is A," neither can it be "A is Y" For here the predicate Y, being different from A, is not A The judgment "A is Y," then, can only mean "A is not A" Since this would be to assert and to deny in the same thought, the process of uniting differences is not to be expressed in the form "A is Y"

The alternative that, in thinking "A is Y," we are really meaning "A has Y," is of no avail For either "A has Y" means no more than "A is A and has Y," the "has" expressing bare conjunction, or "A has Y" means that "A is such-as-to-have Y" On the first alternative, the connection of Y with A remains unexplained, on the second, the copula is again introduced, and the original dilemma remains The one possible method of resolving this dilemma, it is alleged, is afforded by the notion of identity in difference. Judgments uniting differences are adjectives of reality, itself a systemic whole The identity of this whole is the identity in all differences; thus it is this identity in virtue of which A and Y are united in thought

On this view that reality is the principle of identity in appearances, it follows that every appearance is different in quality from

every other Were there two appearances no more than numerically different, they would be identical in quality, and that in mere appearance there should be identity is *ex hypothesi* impossible The identity which unites differences is everywhere and always reality, never appearance Hence, *qua* appearance, no moment can be identical in (or be repeated in) any other Since the very principle of identity is thus excluded from appearance, that all appearances are different means they must be different in quality The principle that the identity in all difference is reality thus implies that in the domain of appearance self-identity implies qualitative difference

Two qualities not numerically different would of course be not two, but one It is thus plain that identity implies numerical difference Because alteration is never complete annihilation, and because to alter a relation is to generate or to disclose a new one, the new relation always has terms not those of the old Hence, from the conclusion that a relation implies terms, and the truism that identity implies numerical difference, it follows that any alteration, whether in relation or in quality, will make at least a numerical difference But, on the assumption that Bradley's is the one method of resolving the dilemma of predication, the identity of appearances implies not only numerical, but also qualitative difference. It would then seem that on this assumption relations are internal, in the sense that any alteration in a relation or a term will make a difference that must be qualitative

Yet this conclusion is of specious validity For it depends not only on the assumption that "identity in difference" affords the sole way of resolving the dilemma, but also on the assumption that all relations are adjectives of a systemic whole It has been pointed out that the first assumption implies all difference to be difference in quality Yet the notion of identity in difference is advanced as the one method of resolving the dilemma of predication So long, then, as relations are taken to be adjectives of a systemic whole, what is true of such adjectives will be true of them also Yet it is not at once obvious that in "A is the father of B" this occurrence of the relationship of paternity is an adjective Were this the sole view of the matter possible, the "internality of relations" would then so far stand established But here let us go back and, after again agreeing with the rejection of separate relations, ask whether the sense in which R relates A and B must

or must not be that A and R and B are so many adjectives or aspects of one systemic whole Bradley assumes this to be the sole alternative: the identity in virtue of which differences are united is the same identity in virtue of which relations relate their terms, that is, the absolute If relations did not imply this "substantial foundation" within their qualities, they would fail to relate them, and thus fail to be relations at all But is it true that the notion of identity in difference affords the sole method of answering the question, What relates the relation to its terms? I wish to urge that this is not true, that to this question we may better reply that R relates its qualities in virtue of the *necessity* that R have some pair of terms or other Thus the proper formula would be not "A is R to B," but rather "R *implies* A and B, and A and B *imply* R"

Since "relations without terms" is mere verbiage, relations necessitate or imply terms This conclusion, the exclusion of separate relations does demonstrate But neither the exclusion of separate relations nor the conclusions thus established imply that being a relation is being an adjective of a systemic whole It may be that adjectives must thus be predicates in order that, being different, they may be united and not just separate But only if what Bradley holds to be the nature of predication must be that in virtue of which a relation relates its terms, will this hold of relations. Thus, even though predication be possible only in virtue of "identity in difference," still it does not follow that relations must relate their qualities as qualities are related in predication For the alternative remains that every relation implies some pair of qualities or other, and that every quality implies some relation or other

Since for the idealist the internality of relations is the presupposition of there being any necessity at all, it will perhaps be objected that this attempt to explain that relations relate terms in virtue of the necessity that they have terms is remarkably blind Yet Bradley asks, "Are qualities and in general are terms altered *necessarily* by the relations into which they enter?"[9] The answer is of course affirmative This means not that in fact relations do alter their terms, but that relations are such that of necessity their terms are thus affected by them Necessity, then, is explicit in the very definition of an internal relation Hence, necessity or implication can in no sense depend on or be mediated by that which by

[9] "Note B."

definition it contributes to define Hence, it is not in virtue of their alleged "internality" that relations necessarily alter terms, for it is because relations thus of necessity affect their terms that they are called "internal"

It may be further objected that this in no way touches the fact that for Bradley the principle of necessity is that of systemic totality For this reason, to explain that a relation relates its terms in virtue of implication, is to say nothing with which he must so far disagree But this systemic whole either is supra-relational, or is exhaustively constituted by moments in internal relations On the first alternative, that whole cannot even be mentioned Either you in some sense know what you refer to, or else you mention what you in no sense know That this whole may be referred to, it must stand in some relation or other to experience Yet whatever is in relation is by that very fact appearance, and that, the absolute can hardly be The reply that this whole may be known by analogy with immediate experience fails to be plausible, for what is any analogy if not a relation of some sort? On the second alternative, the whole is exhaustively constituted by its moments in relation. But to say that thus understood the whole is the principle of implication, is again to assert the condition of implication to be the internality of relations And since implication is involved in the definition of a relation as internal, no such dependence of implication on "internality" can be maintained

If, by his rejection of separate relations, Bradley had demonstrated relations to be such that their alteration would imply a qualitative difference, this conclusion would itself imply that every difference is unmatched or unique For were there two pairs of qualities, or two relations no more than numerically different, a relation might imply one of these pairs, and, on being altered, it might then imply the other one That there should be this alternative is incompatible with the truth of the universal proposition that all difference is difference in quality. For that this proposition may be true, it must be false that some differences may be numerical merely Yet neither the truth of the one proposition nor the falsity of the other is demonstrated by the exclusion of separate relations It is implied, however, by the view that identity is always that of reality in differences On this view of identity, numerical difference is indeed impossible. Two moments no more than numeri-

cally different would still be qualitatively identical, and in appearance repeated identity is not possible Every difference, then, must be unmatched, no difference, no quality or relation, may be repeated If, as Bradley says in the *Logic,* what is true in one context is true in another "is the first of the principles of reasoning," this surely is absurd

Again, it will perhaps be objected that if Bradley has given no demonstration of the proposition that all difference is qualitative, this is because he supposed that to any reader of *Appearance and Reality* as much would be obvious Anyway, it may easily be demonstrated that there are no two indiscernible qualities Take any two qualities A and B It is plain that something can be predicated of A which cannot be predicated of B, that is, something "different from B " The same line of argument applies to A But, now, if from this the conclusion is drawn that A and B are therefore known to be different in character, rather than numerically different merely, then that conclusion can only beg the question The fact that we can say about one of two qualities that it is different from the other, but not about the other that it is different from itself, shows only that we can say they are different which we already knew, it has not the slightest tendency to show that the two qualities are more than numerically different, that they are different in character

In view of the foregoing considerations, I suggest that we are not forced to deny that some qualities and relations are repeatable, and in that sense possible, on the ground that relations are internal and that therefore all difference is qualitative Even so, the defense is not yet at liberty to rest In some quarters at one of the older universities, it is held to be plain that identity is not absolute, but relative Since all difference is a relation, it is said, and since the identity of any quality or relation implies its difference from all else, identity implies difference and therefore is relative This seems to be a *simpliste* version of one of Bradley's arguments referred to above, and it rests on the assumption that difference is a relation Yet, since symptoms at least of the logic that is founded on this view of identity are common, it may be well to attempt to show briefly that this view makes an assertion that is groundless.

On the view that identity is relative, any A is A only *because* it implies its difference from all else Thus, whereas the formula of absolute identity, A is A, claims no ulterior ground, in the formula

of relative identity that claim is made For in that formula it is asserted not merely that as a matter of fact the difference of A from all else is implicated in A, but rather that it is *because* A implies this difference that A is A We must, then, try to find the reason or ground of the inference expressed by this "because "

Since the ground of a consequent cannot itself be an occurrence of that consequent, the inference could not be grounded in anything the identity of which was relative But, it will be urged, on this view of things the absolute is notoriously the ultimate ground of all inference Now, waiving the fact that the absolute cannot stand in any relation at all without *ipso facto* being appearance, with the consequence that the absolute cannot stand in the relation of ground-consequent to any inference, it is still plain that the absolute cannot ground the inference under discussion For, since the identity of the absolute is absolute identity, that being cannot imply that identity is not absolute but relative

The assertion that identity must be relative is thus groundless More than this, it implies the conclusion that no two experiences can have anything in common Were it true that identity implies qualitative difference, there could be no two indiscernible qualities, for were there two such qualities, there would then be one quality the identity of which did not imply its qualitative difference from all else Yet, even so, it may be suggested, a complicated quality, such as the composition of several bronzes drawn from the same mold, may be at least partly the same in different contexts.

But if in two contexts the composition of two examples, A and B, of Maillol's *Femme qui se coiffe* can be said to be at least partly the same, this is because something in the two qualities of that composition is, strictly speaking, the same in the two contexts This discriminated something is itself a quality, and on this suggestion it is repeated in contexts which by hypothesis are not numerically different merely. But this is to say that within the two complicated qualities of composition, A and B, what is the same is therein repeated Hence the identity of the repeated quality in A cannot imply its difference from itself in B. The notion of partial sameness is thus of no avail before the alleged principle of relative identity. So long as that notion is afforded any hospitality whatever, the consequence that every difference is unique or unmatched can hardly be avoided.

On two of the interpretations of the passage from James's writings quoted above, that consequence is implicated in the meaning of the passage Yet, that either the interpretation on which existence or duration is internal to essence or the one on which a quality necessarily is altered by its contexts should constitute a true judgment, depends on the truth of the doctrine that relations are internal and identity relative Since, however, neither aspect of the doctrine that experience is relative is demonstrated by Bradley's argument, that an alteration in a relation will make a qualitative difference in its terms is always a matter to be determined by the appropriate empirical discipline And to the proposal—even though groundless in the logic of its proponents—that the internality of relations may nevertheless be assumed as the principle of a world view which, among other such views, is helpful in elucidating experience, it must, I think, be answered that if as a result of post-Kantian idealism the importance of relations has been given its due, this is an advance because their importance for logical and social theory had before been too much ignored, and not because the specific theory of relations as internal is anything but stultifying to the theory of judgment of which that theory is the principle For were relations internal and identity relative, every single moment of experience would be wholly unique Since the unique is the unmatched, what is unique can be compared with nothing at all, so that were it true that identity implies qualitative difference, the term "such" and the phrase "of the same kind" would be utterly senseless Recollection, furthermore, would not be a fact of any, much less of common experience Were it true that all moments of experience are unique, nothing in this present experience of mine could be repeated or recalled, no moment could repeat in itself anything of the one past, and experience thus would be reduced to moments of sentience, no one of which could exist in a less pristine ignorance than any other To reject altogether, then, the theory of relations as internal, is not so much to question the importance of relations as to reject a doctrine which implies conditions on which recollection and comparison may not occur

But further, were relations internal, and did identity imply qualitative difference, every single experience would be isolated in its own uniqueness, for, since "being unique" cannot in any sense qualify, or be anything with respect to, any two terms, in the realm

of unique reals implied by the doctrine of relative identity, there could be no relations at all

Without recollection, comparison, and relations, judgment plainly could not occur; experience would be reduced to a solipsism of the present moment to be transcended neither by the powers of primitive credulity nor by the vitality of animal faith This, I think, suggests the fundamental importance of the modal form "A may be B" Were we unable to recollect, we should also be unable to expect, we should be confined to the prospect of the present moment, wherein judgments concerning what can happen could not occur But unless we accept a theory about identity and relations which, as I have attempted to point out, is without grounds in its own logic, and is a theory implying that whatever is distinct is unique, we may believe our minds and accept what appears the same as being truly the same in appearance

In concluding thus that some qualities and relations are repeatable, we conclude, I wish to suggest, that such is the sense in which qualities and relations are possible But first it may be well to anticipate a certain objection Since this repeatable complex of discriminated qualities here and now given is actual and, in virtue of its causes and conditions, necessary, it is plainly nonsense to suggest that it is possible This objection depends on the view that the actuality or present duration of the quality is internal to the quality—a view which is, I have attempted to show, groundless in principle Being self-identical and therefore repeatable, the quality is external to its duration As such it may be the object of judgments of the form "A may again be B," no less than of judgments of the form "A is B" That A and B are repeatable and as such possible means that they are self-identical, that respectively they are intrinsically what they are, and therefore eternally themselves. Qualities with their relations here and now are actual, but, being absolutely or self-identical, they also are repeatable, and therefore are properly objects of anticipation in problematic judgments.

In the sense of the term "essence" in which it expresses the most radical sense of the verb "to be," self-identical qualities and relations are essences: they are precisely and fully what they appear to be In saying this, I do not wish to mean as much as I take to be asserted by any theory about universals with which I am acquainted. Essences, being repeatable, are in that sense universal. But es-

sences also are singular There are not two or three or a dozen single qualities in the realm of essence any one of which might as well be the single hue of this copy of Joseph's *Logic* There is only that single hue which, being self-identical, is a priori repeatable, and since this occurrence of that single hue is exhausted in the hue that appears, what is given to attention is neither the sole occurrence of that hue nor a particular occurrence of it, but only and fully the single hue itself But, now if every quality and relation is singular, and as such is exhaustively given in this appearance of itself, how then can the blueness of this copy of Joseph's *Logic* be repeated?

This objection seems to assume that of a singular quality there can be only a certain quantity, so that if it is all given here, there can be no more of it to be given over there Certainly, if all the Vichy water available just now is contained in this bottle, no Vichy can now be available anywhere else Yet since the quality and the relations of this water are self-identical and therefore repeatable, it follows not that no more water of that quality can be available in the future, but only that just now the quantity of such water is limited This is not, I trust, to overlook the Hegelian doctrine of the qualitative quantum That doctrine, however avowedly depends on a theory about relations which is, as I think, groundless in and stultifying to its own logic Furthermore, what may be, and is, can be The hue of this copy of Joseph's *Logic* being self-identical, there is then no reason a priori why it should not be repeated in fact And here in two copies of that *Logic* the single hue is repeated.

Thus, to say that self-identical qualities and relations or essences constitute the possible is to say that they are what can happen again and again in existence, or in a word, that essences are repeatable But saying that essences are repeatable and thus possible, means no more. I think, than is meant by saying that they are self-identical, that is, that they are exhaustively and intrinsically what they are That the course of change or duration shall again so conspire as to exhibit this single quality exhausted in its singularity in these several but respectively single relations, is a question to be answered, if at all, I suppose, on a theory of probability But this quality is repeatable, and as such the proper object of a problematic judgment, simply in virtue of its self-identity, which is no more and no less than what this single quality itself is.

In the formal theory of judgment, the term possible has meaning with reference to judgments which are to some extent uncertified But if the nature of the possible is to be self-identical, singular qualities and relations, the possible is the real so far as that is repeatable quality and relation Possibility, then, is not the proper name of a peculiar aspect or character in reality it is rather a synonym for the self-identical being or essence that any quality or relation is That "the possible" is a synonym for "the self-identical," and so without a unique reference of its own, means not that the problematic judgment is therefore without a proper object, but rather that the object of such judgments is what in reality is repeatable That this should be singular qualities and relations themselves, rather than a peculiar aspect of what is real, indicates that "possibility" is the name not of an esoteric subject in philosophy proper, but rather of the singular essences whose repetition in experience may be anticipated in judgment.

A POSITIVISTIC THEORY OF POSSIBILITY

BY

V. F. LENZEN

A POSITIVISTIC THEORY OF POSSIBILITY

V F LENZEN

THE CONCEPT OF POSSIBILITY plays a fundamental rôle in contemporary philosophy and science. By way of introduction I shall give a number of examples of its use

The concept of possibility is fundamental in an empirical philosophy Thus, John Stuart Mill described matter as the permanent possibility of sensation In contemporary philosophy a thing is often defined in terms of given and possible experiences It is consistent with empiricism to define reality in terms of possibility.

The concept of possibility is useful for the interpretation of the significance of a particular science, for example, theoretical physics In classical physics the laws of physics are expressed by functional relations between variables The values of the variables are numbers which have been or may be assigned by measurement. We may interpret a given functional relation by the proposition, It is possible to assign numbers such that the functional relation is satisfied For example, the law of falling bodies is expressed by $s = \frac{1}{2} gt^2$ This equation is interpreted by the proposition, It is possible to assign variable numbers s and t and a constant g such that the given equation is satisfied

In contemporary quantum theory the concept of possibility occupies an even more important rôle Let us admit that the basis of physical science is the measurement of physical quantities The fundamental idea of the new quantum theory is that it is possible to assign to a physical quantity an operator such that the characteristic values of the operator are the possible results of a measurement of the quantity The concept of possibility is thereby employed in a twofold capacity.

In order to provide a basis for an analysis of the meaning of possibility in the foregoing and other examples, I proceed to the consideration of the general concept of possibility.

I

The term possible is an adjective which is applied to various entities In many instances the meaning of possible is brought out more clearly by considering its contradictory the impossible Now a classification of possible and impossible entities would require a complete metaphysical analysis of the types of reality I shall not, however, go into such a complete discussion, but shall consider only some important types of possible or impossible entity

The term possible may be applied to an event For example, if one tosses a coin a possible event is the turning up of heads A process may be called an extended event The motion of a physical body at half the speed of light is a possible process According to the theory of relativity, however, the motion of a body whose speed is greater than that of light is an impossible process A special kind of event is an act by some person

The term possible may be applied to a thing For example, a bridge across San Francisco Bay is a possible thing A round square, on the other hand, is an impossible thing I remark parenthetically that in a complete metaphysics a thing may be viewed as a series of events

We may also characterize properties of events and things as possible or impossible For example, a speed of ten feet per second is a possible property of a physical body, a speed greater than that of light is an impossible property In this example we may think of the speed as characterizing a motion that is an event Indeed, in a complete metaphysics all the properties of things might be viewed as properties of events I add that it is necessary to introduce the concept of possible property because we may ask whether a property is possible or impossible for an event or thing which is admitted to be possible

In addition to the terms possible and impossible, we use the terms possibility and impossibility. Possibility is the quality of being possible, impossibility is the quality of the impossible. We may refer to a possible entity, however, as a possibility and to an impossible entity as an impossibility Thus the motion of a body at a speed of ten feet per second is a possibility Possible entities constitute a realm of possibilities.

After the foregoing preliminary considerations I turn to an

analysis of the empirical characteristics of possibility What are the properties of possible entities by which we decide that they are possible? I propose to determine the basis for a criterion of possibility

A possible entity is one the nature of which is in conformity with the conditions or laws governing that type of entity For example, a possible event for man is the running of one hundred yards in ten seconds An impossible event is the running of this distance in five seconds The laws of physics and physiology make possible the first, so far as empirical evidence goes, the second is impossible If some one were to announce that a man had run one hundred yards in five seconds, we should say, "That is utterly impossible" Thus a possible event or thing is one that is compatible with a system of laws

Now it must be emphasized that possibility or impossibility is relative to a specific system of laws It appears to be physiologically impossible for a man to run one hundred yards in five seconds. But there is nothing incompatible with the laws of physics in a body moving one hundred yards in five seconds It is thus physically possible, that is, consistent with physical laws, for a man to move at that speed Again, it is physically impossible for a physical body to move with a speed greater than that of light One might contend, however, that from the standpoint of pure kinematics such a speed is possible There is nothing in the concept of speed that renders a speed greater than that of light impossible For example, a disembodied spirit, if such exist, might be able to travel with a speed greater than that of light The possibility, however, cannot be realized by physical means and therefore falls outside the realm of physical possibilities

Thus possibility is relative to a realm or universe of discourse. Now, as we have seen, there is a hierarchy of laws Accordingly an entity which is possible in one system is impossible in another If we consider changes in the possibility or impossibility of an event or thing, we must recognize, however, that different entities are involved For example, if I say that a speed greater than that of light is possible, the entity which may have this property is merely an entity having a speed, the entity might be an angel. But if I say that such a speed is physically impossible I imply that the entity has physical characteristics, such as mass, weight, etc. If I say that

it is possible for a physical body to move one hundred yards in five seconds, I ascribe to the body physical characters But I do not prescribe the means of attaining that speed If I say that it is impossible for a sprinter to run one hundred yards in five seconds I imply that the entity is a body having specific physiological characters

I shall further explain the concept of possibility by discussing the relation between possibility and actuality By actuality I mean reality which exists in the present Things which are given in immediate experience are actual, things which it is possible to experience under certain conditions may also be called actual In the preceding sentence I have defined actuality in terms of possibility, this procedure will be discussed in detail later In the present context I distinguish actuality and possibility.

The actual is possible The observation of an actual thing or event is a verification of its possibility Thus actuality implies possibility But the possible need not be actual At the present moment the bridge across San Francisco Bay is possible, but not actual Indeed, the concept of possibility suggests that the possible event or thing is not actual We frequently characterize a thing as merely possible Thus, although our definition of possibility is such that actuality is a special case of possibility, namely, demonstrated or verified possibility, nevertheless, in the restricted use of the term, possibility applies to an event or thing that is not actual. Concerning a possibility it is important to know the means of realizing it, of making it actual The possible, then, is something which is not actual, but of such a nature that its realization is compatible with the relevant system of laws or conditions

The relation between the possible and the actual suggests alternative expressions of possibility A possibility is something which may be realized under specific conditions, or which can be realized if certain acts are performed The term *may* expresses the idea that the nature of the possible is compatible with some system of laws. The term *can* expresses something more positive, it expresses the capacity or ability to engage in certain types of activity Thus the term *can* implies that a certain act or event is compatible with the laws of the agent's own nature The term *may* expresses the fact that the external environment is consistent with an event or thing. The term *can* expresses the conformity of the possibility to the

intrinsic nature of some agent Thus we say that a body may have a speed of ten feet per second It is possible for the body to move with a speed of ten feet per second Such a motion is consistent with the laws of physics But we say, a man can throw a ball with a speed of ten feet per second It is possible for him to throw a ball ten feet per second It is consistent with the laws of his organism that he throw a ball with the given speed In addition, we use the expressions might and could These terms express possibility, not actuality under certain conditions For example, if a southwest wind is blowing we say that it may rain But we say, if a southwest wind were to blow it might rain Again, a good sprinter can run one hundred yards in ten seconds We may say of a certain man that he could run one hundred yards in ten seconds if he would train It would be possible for him to run that fast if he would conform to certain rules Thus might or could express a possibility which is conditioned by another possibility

In view of the preceding discussion we see that there is a correlation between possibility and the future So far as the possible is not actual the realization of the possible belongs in general to the future This is especially exemplified by physical possibilities, since physical processes occur at a finite speed Thus we may think of possibilities, that is, possible events and things, as in the future An important example is a possible experience A possible experience will be transformed into given experience if specific processes occur These processes require time, and thus the present possibility is transformed into an actuality in the future

To summarize the foregoing discussion of the empirical characteristics of possibility The concept of possibility expresses compatibility with specific conditions or laws In a wide sense the actual is possible, but in a more restricted sense a possible entity is one that is not actual at the moment The terms *may* and *can* indicate whether possibility is consistency with external or internal conditions. The terms *might* and *could* express possibilities that are subject to conditions which in turn are possibilities. We have also seen that possibility is relative to a realm or universe of discourse. Indeed, the foregoing discussion has been in terms of examples which belong to a restricted realm, namely, of physical and physiological possibilities But there are many other realms of possibility.

A mathematical possibility is one which is compatible with the

laws which define a system of mathematics Consider, for example, the equation $5x = 5$ This equation has one possible solution, there is only one value of x which satisfies the equation The equation defines only one possibility for x Consider next an equation such as $x + y = 0$ There is a set of possible values of x and y which satisfy the equation A more complex definition of a possibility is given by an ordinary differential equation The solution expresses the dependent variable as a function of the independent variable and an appropriate number of arbitrary constants For every specification of the arbitrary constants one obtains a possible particular solution A possible solution is a function of the independent variable which satisfies the differential equation In general we may interpret the creation of a system of mathematics as the construction of a set of possibilities—objects that satisfy the laws of the mathematical system

Mathematical possibility is something of an exception to our general principles It is doubtful whether the temporal aspect is relevant, and furthermore the distinction between actuality and possibility tends to disappear

Somewhat similar to mathematical possibility is legal possibility A legal possibility is one which is consistent with the laws of a state

Of particular interest is the concept of theoretical possibility A theoretical possibility is exemplified by an explanation or hypothesis which serves to interpret facts Thus we speak of a possible hypothesis Again a deduction from a well founded theory is a theoretical possibility This latter type of possibility occurs often in contemporary physics Recently R C Tolman and others have discussed possible models of the physical universe, the criterion of possibility being consistency with the general theory of relativity The theory is sufficiently general to permit the construction of various models which conform to the laws In other words, a set of worlds is possible In order to decide which of the various theoretical possibilities is actual, recourse is had to observation in order to discover the details that are not prescribed by the theory. It is conceivable that a more detailed theory may be discovered in which there is only one possibility which is the actuality

As another example let us suppose that an electron is revolving around a positive nucleus, and suppose that the initial conditions are such that the orbit is an ellipse Then in classical physics a

continuous series of ellipses is possible, that is, consistent with the laws of motion The Bohr quantum theory of the atom was based upon the principle that not all classical orbits are possible The possible ones are subject to quantum conditions Thus the classical possibilities were limited by additional conditions The theory does not determine which orbits are actual, this must be discovered by observation on spectra

II

Having sketched the empirical characteristics of the possible, I propose next to analyze the function of the concept in definition. As a first illustration I consider the definition of a thing A thing may be exemplified by a table, chair, etc At the present moment I am perceiving a thing, the desk upon which this paper is placed My perception of the desk originates in my experience of a visible aspect of the desk The desk is an entity with an aspect which is given in my present experience But the given aspects of the desk by no means exhaust its nature If I perceive from another position I experience aspects of the desk which are other than those which are at present given to me We may express this fact by the statement that the desk has given and possible aspects The aspects of the desk which are not now given, but which I could experience if I acted in a specific manner, are called possible aspects The desk consists of the totality of its given and possible aspects

The possible aspects of a thing are correlated by definite laws Thus if I walk away from the desk I shall experience a sequence of aspects which are correlated by the laws of perspective Having found such relations between the aspects of a thing, we have a method of determining whether an imagined aspect is possible or not Suppose that I propose the hypothesis that a describable aspect of the desk is a possible aspect from a specified point of view. If the aspect conforms to the laws of correlation between the aspects it is a possible aspect Aspects which have been observed are proved by observation to have been possible Hypothetical aspects may be proved to be possible or impossible by reference to the laws of correlation. The final test of possibility, however, is observation.

An actual thing, such as the desk, is thus defined in terms of the possibility of aspects But since we distinguished between possibility and actuality there appears to be a contradiction.

A possible thing is to be defined in terms of the possibility of

aspects. An actual thing is also defined in terms of possible aspects. Now a possible aspect becomes a given one if certain processes occur, for example, if certain acts are performed The processes by which the possible aspects of a possible thing become given are different from those by which the possible aspects of an actual thing become given. Experience of the possible aspects of a possible thing requires specific constructive activities The possible aspect of an actual thing may be experienced after activities such as turning the head walking etc . that is, after activities which ordinarily are not called constructive The type of activity involved in building a house so that one may perceive it is different from the activity of going to see a house which is already actual Thus there is no contradiction between the view that the possible is not actual and the definition of an actual thing in terms of possibility.

Our analysis of the concept of thing thus yields the result that a thing is a possibility of perception The thing consists of its possible aspects We may express the nature of a thing by the statement that it is possible to experience aspects of the thing. If one performs specific operations one will experience specific aspects of the thing The definition of a thing in terms of possibility is thus expressed by a conditional proposition

A second example of the use of the concept of possibility is given in the definition of space Einstein has offered the following description Space is the totality of possibilities of relative position of practically rigid bodies Instead of the expression possibility of position we may use the phrase possible position Space, then, is the totality of possible relative positions Now our knowledge of space is based upon the observation that bodies stand in specific relations to one another For example, we may have three bodies A, B, C, such that B is between A and C Our apprehension of the nature of this relation involves an understanding of the formal properties of the relation, for example, that it is transitive Our apprehension also involves an intuitive knowledge which is obtained when we actually perceive three bodies in such a relation. Again, between two bodies there is a quantitative relation called distance. Thus we find various spatial relations between bodies The statement that a body is in space means that it is a term to these several relations The position of a body is the quality of being a term to such spatial relations.

Now, given a specific configuration of bodies, it is possible to displace the bodies so as to change the configuration It is possible for the bodies to stand in different relations Thus if B is initially between A and C, it is possible to displace the bodies so that A is between B and C Again, the distance between two bodies may be changed, that is, it is possible to change the distance between them. The foregoing description expresses the meaning of the statement that space is the totality of possible positions, or the totality of possibilities of position It is of the nature of space that bodies may stand in various spatial relations It is compatible with the nature of space that a system may occupy in the future a position which is at present a possible position The statement, a specific position of a system is possible, means, if the system is acted upon in a specific manner, the specific set of spatial relations between the constituent bodies and some frame of reference will become actual. The description of space in terms of possibility implies that it is possible to displace a system from a specific position to a new position.

In concluding this discussion about space I remark that since a body is defined in terms of possibility the definition of space in terms of possibility involves possibility in a twofold manner.

As another example let us consider the concept of energy In dynamics the energy of a body is defined as its capacity to do work. For example, if a body of mass m is moving with speed v, in virtue of its motion the body can do work against an obstacle of amount $\frac{1}{2} mv^2$ This quantity is the measure of the kinetic energy of the body Thus the kinetic energy of a body is its capacity to do work in virtue of its motion We may now express the concept of energy in terms of possibility The statement, a body has kinetic energy, means that it is possible for the body to exert a force against an obstacle through a distance and thus do work If a body is moving freely with a speed v it is not doing work But if it meets an obstacle the body will exert a force on it through a distance, thereby doing work.

Again, a system is able to do work in virtue of the relative positions of its parts Thus, a stretched spring is able to exert a force during the displacement which brings it back to the unstretched position. A system which is able to do work in virtue of the relative positions of its parts is said to have potential energy Potential energy is the capacity to do work in virtue of position If we now

model our definitions after those of thing and space we may say that the energy of a body or system is the possible work it can do

Energy is defined in terms of the possibility of exerting a force through a distance Since space is defined in terms of the possibilities of position of bodies, and bodies are defined in terms of possible experiences, it follows that the concept of energy involves possibility in a threefold manner

One may also give an account of universals in terms of possibility Let us suppose that we have given two red patches Each patch has its specific qualities which, following Professor D C. Williams, I shall call abstract particulars Now by assumption the two patches are similar in a specific respect, they are similar with respect to color In the theory of universals we form the concept of a universal redness of which the specific redness of each patch is an instance The universal redness may be called an abstract universal

The empirical facts may now be expressed in terms of the concept of possibility To say that a particular quality of the patch A is an instance of a universal, means that it is possible to find patches B, C, D, etc , such that A is similar to B, A is similar to C, etc , in a specific respect That A, B, C have a common quality, redness, means that it is possible to establish a relation of similarity between A, B, C

As a final example I shall interpret the equations of physics in terms of possibility

Our knowledge of the physical world is expressed in equations; for example, the law of falling bodies is expressed by $s = \frac{1}{2} gt^2$ In order to interpret such an equation let us describe an experiment by which it is verified The law of falling bodies may be verified by observations on a ball rolling down an inclined groove Let us suppose, then, that we have constructed such a groove Our next task is to lay off a scale for the measurement of distances along the groove We therefore take a standard measuring rod, place one end at the top of the groove and attach the symbol 0 to the point on the groove which coincides with the end of the rod. The point which coincides with the lower end of the rod is labeled 1 The rod is then displaced so that the upper end coincides with the point labeled 1, and the point coinciding with the other end is labeled 2, etc In this manner a scale for distance is constructed along the groove In

addition we have a clock which ticks, each interval between the ticks being a unit of time We are now ready to begin the experiment

We place the ball in the groove so that its position is to be labeled 0 Then, upon a given tick of the clock, which is labeled zero, we release the ball As the ball rolls down the groove we observe its position at the successive ticks of the clock Suppose we find that, at the times 0, 1, 2, 3, 4, the position of the ball is 0, 1, 4, 9, 16 We can express the correlation of distance passed over with elapsed time by $s = \frac{1}{2} at^2$ That is, the distance varies as the square of the time We may now express the significance of the formula by the statement, It is possible to assign variable numbers s and t, and a constant a, such that $s = \frac{1}{2} at^2$ Now as the angle of inclination of the groove is increased the constant a approaches the value g, where g is the constant acceleration of freely falling bodies Thus, if one assigns numbers in accordance with prescribed rules, the numbers satisfy a specific functional relation

It is necessary to add that the interpretation of an equation which expresses an experimental result, must be formulated with care If the experiment has been performed we may express the result of the experiment by the statement, Numbers were assigned such that a specific relation was satisfied Or we may say, It was possible to assign numbers so that a specific relation was satisfied. If we say, however, It is possible to assign numbers such that a specific relation is satisfied, then we imply that this possibility could be realized in the future We are making a prediction If the prediction is made upon the basis of a past experiment one presupposes a principle of the uniformity of nature

III

Thus far, I have considered the empirical criteria of possibility and its function in the definition of concepts We must now consider the metaphysics of possibility. I wish especially to consider the ontological status of a possibility while it is merely a possibility. What is the reality of a possibility before it is realized and becomes an actuality? There is also the related problem of the ground of possibility.

An adequate answer to the present problem would require a complete metaphysics I shall limit my discussion, however, to the

status of those possibilities which have been referred to in the definitions and descriptions of the preceding discussion I am interested in the status or grounds of the possibilities which characterize actual entities, such as actual things, space, energy, universals, and equations which express physical laws

The fundamental problem is that of the ontological status of the possible aspects of an actual thing The thing, as we have seen, consists of given and possible aspects What is the ontological status of the possible aspects while they are merely possible? One also uses the term possible experience What is the status of the content of a possible experience while it is merely possible?

The first theory which I shall consider may be called a neo-realistic theory of possible aspects According to this theory the non-experienced aspect, the possible aspect, is actual though not given. The transformation of a possible aspect into a given aspect does not change the ontological status of the aspect The change from possibility to actuality is merely the proces of knowing

As an illustration consider a round penny and let us suppose that its position is fixed in space for a time sufficiently long that the following considerations will hold As I walk away from the penny along a transverse diameter I experience a series of round visible aspects which become smaller and smaller According to the neo-realistic theory all these aspects exist prior to their apprehension The process of awareness is merely a selection of what already exists But the set of circular aspects is but one set of aspects of the penny If I walk from the penny in an oblique direction I shall experience a series of elliptical aspects Corresponding to every possible line from the penny there is a series of aspects On the neo-realistic theory the world becomes very full of aspects

In contrast to the neo-realistic theory we may hold that the possible aspect has no reality when it is merely possible The possible aspect of the desk which I do not at present perceive is an object of thought, but nothing real, actual, or existent. From this point of view things exist only when they are perceived Their reality is constituted by perception I shall call this theory phenomenalism According to phenomenalism, reality is to be ascribed only to the momentary contents of consciousness The unfolding of experience is the creation of reality The further development of phenomenalism may be continued in various ways

One may view consciousness as a complex of present experiences All that one can do is to describe the order of appearance and disappearance of contents of experience There is no further explanation of the transformation of possibilities into actualities One can find sequences among experiences In the light of these sequences one may venture to predict that a given experience will be followed by a specific experience, but the mechanism whereby a possibility becomes an actuality is not considered This theory is Humean skepticism

Or one may assume that the subject is a substantial entity which generates the order of experience Experience is the creation of reality by a subject This theory may be called subjectivism

A theory which is intermediate between the neo-realistic theory and phenomenalism is dualistic realism According to this view the possible aspect is not real when it is only possible One may, however, speak of a ground of possibility which is actual Such a ground of possibility is an independently real thing The experienced aspect of the thing is the representative of the real thing The reality acts upon an observer and thereby produces the observable aspects of the thing, so that the observable aspect is the outcome of an interaction between the thing and the observer. It is beyond the scope of the present paper to discuss the various types of dualistic realism

The positivist, however, would brush aside these various theories of the status of the possible aspects of actual things, and declare that it is hopeless or even meaningless, to raise the question of the status of possible aspects From the positivistic point of view possibility is a fundamental concept The only explanation that one can give of the possibility of aspects of an actual thing is that the aspect will be given after a specific type of activity, namely, the activity which results in perception If I should perform specific acts I would experience the aspect The nature of possibility is thus expressed by a conditional proposition My view is that the positivistic theory is an adequate basis for a philosophy of science. Hence in this paper I do not wish to decide the more ultimate question of the ontological status or ground of possibility.

The positivistic function of possibility may also be exemplified in the theory of space Space was defined as the totality of possible positions What is the status of a position while it is merely possi-

ble? A realistic theory of space would attribute actuality to the possible positions In effect, possibility is thereby transformed into a substance In a positivistic theory one would recognize that the concept of possibility of position merely expresses the conditional proposition, If a system is displaced it will occupy some new position. From the positivistic point of view it is unnecessary to hypostatize possibilities of position

The energy of a body or system is defined as its capacity to do work Using the concept of possibility, we may say, that a body has energy means that it is possible for the body to exert a force through a distance Energy is defined in terms of the possibility of doing work What is the status or ground of this possibility before it becomes actual? The physicist has found an answer in the concept of energy as a substance Thus we hypostatize the possibility of doing work into a substance which resides in the body which can exert a force through a distance The concept of energy is then not merely an expression of possibilities it represents a substance From the positivistic point of view one should restrict oneself to the definition of energy in terms of possibility That a body has kinetic energy, for example, means not that a quantity of substance inheres in it, but that if the body meets an obstacle it will do work upon it That a body has kinetic energy means that it is possible for the body to do work

Let us now turn to the problem of the ground of concepts The formation of concepts is an expression of the fact that there are similarities between the qualities of different things For example, let us have given two red patches The color of the one patch is similar to the color of the other patch We may therefore represent the color of both patches by the same concept of redness Thus we say that the color of this patch is red, the color of that patch is red The phrase "is red" expresses the application of the concept of redness to the qualities of the two patches and thence to the patches The applicability of a concept to experience expresses the fact that it is possible to find several things with similar qualities. The positivistic interpretation of concepts would rest at this point. The realist, however, transforms the possibility into a substance when he assumes the reality of the universal which appears in all its instances Thus the ground of the possibility of similarity is identity The two red patches have identically the same redness as

quality What is the status of the universal when it has no instances? In the realistic theory the universal dwells in a realm of subsistence The possibility of similarity is transformed into a universal which has actuality in a realm of subsistence.

As a last topic in this discussion of the ontological status of possibility I wish to consider the basis of the interpretation of the equations of physics We have seen that physical laws are expressed by equations such as $s = \frac{1}{2} gt^2$, $F = ma$ We are immediately confronted with a problem of interpretation One interpretation is that an equation expresses a relation between properties The symbols do not stand for the measures but for the properties. But this view requires the realistic theory of universals The positivistic interpretation is that an equation implies that it is possible to assign numbers such that the equation is satisfied I wish now to consider the ground of the possibility We immediately come upon some further problems of interpretation

Let us take the equation $F = ma$, *force is equal to mass times acceleration* I raise the question, Is it significant to ask whether this equation is true or false? In other words, Does the equation express a proposition or does it express a definition? If the equation expresses a definition it is meaningless to ask whether it is true or false Now, the foregoing equation is one that has been interpreted in various ways One may say that we have independent definitions of force, mass, and acceleration and that therefore it is significant to assert the relation between them Or one may contend that the equation is merely a definition of the symbol F in terms of mass and acceleration Now in the development of science an experimental law is frequently transformed into a definition One may contend that this transformation has occurred in the force equation. In view of a certain amount of freedom in the interpretation of our equations, I adopt, therefore, a genci al interpretation Concerning an equation such as the force equation the important question is whether it is applicable for the description of phenomena. If it is applicable it may be either because the relation holds between the independently defined quantities, or because the equation defines a quantity the introduction of which simplifies the theory. For example, we may interpret the force equation in the following way: It is possible to assign m and a such that $F = ma$ is useful in the building up of a system of physics

Whether our equations be interpreted as true propositions or as useful definitions, it is certainly true that it is possible to assign some symbols, such as numbers, to bodies and phenomena This raises the question, How is measurement possible? Let us assume that we can assign the symbol m to a body so that m may be called the measure of mass How is this possible? In answer one may assume the existence of physical properties so that there is a correspondence between physical properties and symbols

Let us take length One of the properties of physical bodies is that of length, for example, the length of a rod. Now, we can see and feel a length Eddington I might add, contends that length is not part of the picture which the physical world presents to us I shall assume, nevertheless, that we experience length as a quality Now, we judge lengths as great or small and by means of qualitative estimates we arrange lengths in a series by means of the relation "greater than" or "less than" But we can measure a length In order to do so we take a rod the length of which is assumed to be standard and count the number of times that the standard can be laid off on the length which is being measured This operation depends upon the observation of coincidences One end of the standard is brought into coincidence with one end of the rod to be measured The other end of the standard is marked on the rod Then the standard is displaced so that its origin coincides with the point which previously coincided with the other end of the rod, etc By counting, one obtains a measure-number which expresses the length of the rod with respect to the given standard Thus it is possible to assign a measure to a quality

Is the method of measurement correct? Does the previously described method correctly measure a length? If we raise the question of the correctness of the method of measurement we assume that there is an independent measure of the quality But this is not so The process of measurement is characterized by individual criteria by which it is determined whether it is correctly applied or not The measure is assigned by a method which is determined by convention The method of measurement creates a new character of the body—a character which in our example is defined in terms of the coincidences observed with a standard rod Such a character is useful because it is reproducible and because there is a good correlation with qualitative length With reference to

length which has an intuitive basis, one may contend that the experience of length furnishes the ground of the possibility of measuring length The same argument might hold for hotness and its measure, temperature But when we consider properties like electric charge, magnetic pole strength, etc the matter becomes more doubtful These properties are defined in terms of the accompanying forces Numbers are assigned, but there is no direct intuitive basis as there is for length and temperature Now, since all physical measurements depend upon the observation of coincidences, it follows that a measure-number is in effect the representative of certain possibilities of coincidence The possibility of measurement depends upon the possibility of reproducing coincidences

It is, however, attractive to assume the existence of properties which are symbolized by our measures Relations between properties could then be viewed as the ground of the possibility of our equations between measures The empirical fact is, however, that for the most part we work with numbers which are obtained by the observation of coincidences We must therefore assume the properties The assumption of properties corresponding to measures may be interpreted in one of two ways It may be viewed as an hypothesis which is either true or false We would then have to assume some other means of access to the properties Or the assumption may be viewed as a postulate which creates the properties by definition But such an assumption of properties presupposes the realistic theory of universals The positivistic criticism is that the material for theoretical discussion is furnished by the measurements Measurement is based upon coincidences The functional relations which express physical laws express correlations between coincidences The possibility of measurement from the empirical point of view is based upon the observability and reproducibility of coincidences The usefulness of measurement depends upon the predictability of coincidences upon the basis of past coincidences. Such predictability implies an order of nature How is such an order of nature possible? Thus the problem with which we started, how is it possible to assign numbers such that specific relations are satisfied, is but a special case of the more general problem, how is an order of nature possible A discussion of the ground of the order, if there be such, lies beyond the scope of the present paper But this much may

be remarked partly by way of summary We have a tendency to hypostatize possibility in order to furnish a ground for it. We transform possibilities into substances Thus, the possibility of experience which constitutes a thing is transformed into an independent reality Space and energy are transformed into substances and the concept gives rise to a subsistent entity The realistic tendency would be to ground the possibility of science in an order of nature It accords with the spirit of a positivistic theory of possibility to ignore such problems

IV

As a final topic I shall interpret the quantum theory in terms of a positivistic concept of possibility It is necessary, however, to preface the discussion by an account of the relation between possibility and probability

The definition of probability requires the concept of possibility Consider, for example, a coin which has two faces, heads and tails. If one tosses the coin and allows it to come to rest on a flat surface, there are two possible results, either heads or tails turns up I have previously pointed out that possibility implies compatibility with a system of laws The set of possibilities in the present example is determined by the laws of statics The possible results of a throw are those in which the coin lies flat in stable equilibrium Theoretically the coin might stand on edge, practically, however, this result does not occur Hence we may say that the laws of statics, which determine the states of stable equilibrium of the coin, determine that there be two possible results of a throw, heads and tails Now, suppose that the coin is thrown many times, or that many coins are tossed simultaneously The approximate outcome of the experiment is that half of the results are heads and half tails In a series of experiments the fraction of heads or tails will fluctuate about the number one-half Accordingly we say that the probability that heads will turn up is one-half, similarly the probability of tails is one-half Both possibilities are said to be equally probable. The probability of a given result is equal to the ratio of favorable occurrences to the total number of equally probable possible occurrences

In order to prepare for the statement of the quantum theory I wish also to review the description of a thing. A thing, we have

previously seen, is to be described as an entity having possible aspects, some of which may be given Even though no aspect of a thing is given at a specific moment, the thing may exist, or be actual We may assert that the thing exists, that it is red, etc. The meaning of such assertions is that it is possible to perceive aspects of the thing, for example, a red aspect If we act in a specific manner we will experience aspects of the thing The foregoing account is a qualitative description of a thing

Now we can assign numbers to the properties of a thing. Accordingly it is possible to give a quantitative description of a thing in terms of the several measures that it is possible to assign to it. For example, we may say that a rod is ten feet long This means that it is possible to lay off a foot rule ten times along the rod If one performs specific operations one observes coincidences in virtue of which one assigns the measure ten, relative to a foot rule, to the rod From the physical point of view a thing is characterized by the measures which can be assigned to its properties. I call a thing which is characterized by physical measures a body Thus a physical body is a thing for which a set of physical quantities have specific values From the quantitative point of view the measures are the essential characters of a body or system That a body is a particle is expressed by the proposition that the position of the body is represented by precise values of coordinates, such as x, y, and z We conceive of these values as characterizing an entity which we picture in our imagination as a very small body, for example, a sphere This image is an aid to thought, but its intuitive aspects must not be taken too literally Thus, the spatial coordinates of a body may be imagined upon a background of intuitive space. Similarly, the temperature of a body may be imagined upon a background which originates in sensations of hotness and coldness. The measures of electric charge and magnetic moment, however, do not have such a direct intuitive basis We would need to postulate properties which correspond to these measures.

From the physical point of view the essential nature of a physical system is characterized by the values of a specific set of numerical measures Corresponding to possible aspects there are possible values of specific physical quantities The system is characterized qualitatively by possible aspects, quantitatively by possible measures, measures which may be obtained on observation. That a sys-

tem with specific metrical characters exists, means that it is possible to find specific values for a set of physical quantities We would say, however, that the system actually has those metrical characters The meaning is that it is possible to obtain these values upon measurement The assertion that the system is truly characterized by its possible measures means that if one performs prescribed operations specific measures will be obtained Now in classical physics the possibility was determinate Under prescribed circumstances and upon specified operations only one result would be obtained Ignoring errors of measurement the possible measure was unique

The quantum theory has introduced a radically different point of view The fundamental assumption of this theory is that it is possible to assign to a physical system an operator which stands for a physical quantity The characteristic values of the operator are the possible results of a measurement of the quantity Thus instead of a unique and determinate possibility as in the classical theory, there is a set of possibilities associated with a physical quantity The transformation of a possibility into an observed measure is not determined According to the classical theory, if one performs a specific operation one obtains a definite result According to the quantum theory, if one performs a specific operation one does not in general obtain a specific result Any one of a set of values may be determined In the classical theory the realization of a possibility is certain, in the quantum theory the realization of a possibility is a matter of probability which varies from zero to one There is a probability for the observation of each specific possibility

Consider, for example an electron which is moving in a straight line with a determinate momentum The position of the electron on the line is indeterminate All positions are possible and have an equal probability We represent the state of the electron by a wave function which determines a probability of position which is independent of position

We may now ask, What is the status of the possibilities of position before observation? This question is similar to the one concerning the status of the possible aspect of the desk before I perceive it The positivist ignores this question All that one has a right to say empirically is that if one performs specific operations

one will experience the possible aspect The meaning of the possibility is expressed by the conditional judgment A similar view is to be adopted for the quantum theory If we ask, What is the status before observation of the various possibilities of position of an electron, the positivist replies that the only significant statement one can make about these possibilities is that if we perform specific operations we shall experience one of a set of possibilities

Since a specific property of a body is thus characterized by a set of possibilities, our classical pictures are not wholly adequate as images of physical reality In particular the classical image of a particle must be used with caution But we should not be too disturbed by this result When we imagine a classical particle we tend to think of possibilities as really existing while only possible We construct our image in the light of a realistic theory. But in the positivistic interpretation we must not raise the question of the ontological status of possibilities while they are merely possibilities

If an electron has determinate momentum we represent its state by a wave function such that it determines a probability of position which is independent of position All positions are possible and equally probable But just as we say that a body is red when a red aspect is a possible experience, so we may say that the electron is distributed along a line in the sense that all positions are possible for observation There is no difficulty in this view if we stick to a positivistic theory But if we think of the possibilities as actualities, if we adopt a realistic theory of possibility, then we have the difficulty of deciding how the electron can be at all points on a line The difficulty is the same as that raised in considering the body which feels both warm and cold Such fundamental difficulties in the theory of knowledge are ignored, evaded, or transcended, in a positivistic theory of possibility

Suppose that we wish to imagine an electron We may use as image a classical picture of a particle, but we must recognize that a determination of position may not yield the same result in every experiment We need to think of the electron as distributed in space But the distribution is one of possibilities. If such an idea seems paradoxical it is because we hypostatize the possibilities into the actualities of a realistic theory

The question may be asked, Is the indeterminacy in reality or in knowledge? Since reality is defined in terms of possibility and the

possibilities are not determinate the indeterminism characterizes reality If we suggest that reality is determinate, but knowledge is indeterminate, we think in terms of a dualistic theory of knowledge The positivistic theory, however, is designed to avoid dualism We may also attempt to restrict the indeterminism to the numerical measures and ascribe determinateness to properties, but then we have the problem of finding a means of access to these properties Strict adherence to the empirical situation requires us to interpret indeterminism in measurement as an indeterminism in reality

I need also to explain in positivistic language the propositions about the probability of a specific possibility We have seen that probability is defined in terms of a statistical ratio Hence, if we say that an electron may be found in any position along a line and that all positions are equally probable, our assertion is a statistical one It means that we must consider an assembly of electrons, all having the same momentum If we divide the line into equal segments, equal numbers of electrons will be found in all the segments, chance fluctuations excepted

The position of a single electron is characterized by a set of possibilities Upon observation the electron may be found in any one of a set of positions Now, there seem to be two possible modes of interpretation of this fact We may say that the state of the electron is formed by superposition of states The electron is in a sense distributed along a line This is Dirac's mode of expression Or we may say that the nature of the electron is to be defined in statistical terms An experiment with an assembly reveals that on the average the same number of electrons is found in equal segments of the line The electron is always found in a definite position, although the particular position is subject to a statistical regularity This last interpretation seems to be the most strictly positivistic It also allows us to think of electrons as particles At the same time we must avoid the view that the electron really has a definite position before observation. The concept "before observation" is not permissible, before observation there is, strictly speaking, only a possibility of position, which according to the theory is not strictly determined Nevertheless, just as we say that a thing is red, before the red aspect is given, so we say that the electron has position, before the particular position is given If the momentum is deter-

minate, we cannot say before the observation that the electron is at a particular position The measurement creates the specific position

Thus we can use the particle picture with limitations. The wave picture furnishes a graphical representation of the wave function which determines the probability of occurrence of the electron in a specific position Thus, in the quantum theory the electron may be visualized with the help of the images of particles and waves.

In view of the length of this paper I must forego an extended summary I hope, however, that I have indicated the importance of the concept of possibility in definitions of fundamental concepts of science and philosophy A realistic philosophy provides an ontological status or ground for possibility In a positivistic theory reality itself is defined in terms of possibility According to positivism the meaning of possibility is exhausted in compatibility with specific conditions or laws That a specific event is possible, means that if specific conditions are realized the event will occur. Thus the meaning of the law and the possibility of the event which is determined by the law are expressed by a conditional judgment.

The positivistic theory of possibility ignores many problems which have been considered fundamental in philosophy. The theory is attractive, however, in that it is a direct expression of experience. Thus the positivistic theory of possibility is fundamental in an empirical philosophy of science

POSSIBILITY AND CONTEXT

BY

J. LOEWENBERG

POSSIBILITY AND CONTEXT

J. LOEWENBERG

IF ANYONE MENTIONS POSSIBILITY I do not know what he means until he qualifies the noun by some adjective To make himself intelligible to me, he must qualify possibility as logical or empirical or physical or practical or psychological or in some other way Each qualification suggests a context in which possibility acquires a definite sense and use For instance, if logical possibility is tantamount to conceivability, the ability to think without contradiction does not determine what is possible outside the realm of conceptions Mathematical infinities, categorical imperatives, concrete universals, angelic souls, celestial cities, these and like conceptions are certainly not beyond the power of human thought, though possible *in intellectu*, their possibility *in re* is another matter The possibilities open to thought seem unbounded but we must look for them in that context alone in which thinking occurs By merely taking thought we are unable to decide what is possible in nature or experience The most incorrigible rationalists will admit that freedom from contradiction cannot by itself guarantee the physical possibility of an earthquake, the psychological possibility of a crime, the biological possibility of immortality, the economic possibility of balancing national budgets, the legal possibility of controlling the liquor traffic, the political possibility of changing an acquisitive society into a functional one, the religious possibility of worshiping an emergent deity The point hardly needs stressing that such possibilities are quite distinct from those which we qualify by the adjective "logical." The conditions requisite for conceivability specify but one class of possibility. There are other classes And each depends upon those conditions which determine the nature and extent of the particular context to which it is related. Unqualified possibility, possibility *uberhaupt*, I regard as altogether meaningless We may distinguish sundry types of qualified possibility, the qualification being supplied by the different

contextual situations from which we abstract them, and, as long as these contextual situations remain specific, the possibilities they entail must be viewed as enjoying equal specificity

I am in the habit of expressing the distinction between the unqualified and the qualified by setting in opposition the words "as such" and "such as" It is an old story that philosophers are bent upon the "as such"—being as such, knowledge as such, truth as such But without illustrative samples such as those which different contexts supply, general concepts have no denotation The result is either neglect of all context or exaggeration of some particular context We are in danger of treating a general concept as a pure and absolute notion, one not derived from concrete and denotable things and events, or else we have the tendency to endow with generality a concept exemplified by characteristic objects and occurrences drawn from certain specific fields We confidently expect any "such as" to conform to what we define abstractly to be the "as such," or we grossly mistake for the "as such" what is merely a selected "such as" Possibility, we shall soon see, is an example of this Either we tend to de-contextualize the concept, holding it to be universally applicable, or we surreptitiously substitute for its general import what is true only under the limiting conditions of a given context The temptation is great to construct the notion of possibility as such, one under which all conceivable possibilities might be subsumed, the temptation is equally great to select as model a special type of possibility, such as the logical or the psychological or the physical or the practical, and draw to its scale every other type It will be the task of this essay to impugn both these tendencies I shall show that there can be no possibility as such and that possibilities such as various contexts imply are irreducible to each other

But before I embark upon my task I should like to enter a caveat against the use of possibility as substantive, as if it stood for some *ens in potentia*, some independent entity or being, concerning which we must ask where it has its abode, and in what manner it dwells there If one possibility is said to be "logical" because its conception involves no contradiction, and another is spoken of as "physical" because its occurrence is compatible with the laws of nature, where is the one when not conceived and the other before it has happened? What kind of thing is that which only may be? How

confront an object whose capacity for being is the only being it has? These queries are familiar The preceding papers in this volume have all, in one form or another, raised the question of the ontological status of possibility Mr Lenzen, in particular, has alluded to different theories bent upon reifying the possible by investing it either with existence or with subsistence These theories, so ably sketched by him, all assume that an *ens in potentia* is a veritable *ens* The assumption, whatever the epistemological and metaphysical motives behind it, owes not a little of its plausibility to the linguistic expedient of turning an adjective into a substantive There is nothing which discourse cannot transform into an entity by making it the subject of an attributive or relational judgment. Possibility is nothing but a substantivized predicate Capacity for being, and this is all the predicate signifies if we adhere to its etymological sense, cannot be endowed with being without an initial self-contradiction Between being and capacity for being, the distinction must be drawn if the adjective possible is to have even a semblance of significance The only being which the possible enjoys is that of a term in discourse And anything which in discourse we dwell upon, anything which becomes a theme of analysis and description, acquires in a trice the status of a substantival entity For adjectives when qualified by other adjectives inevitably assume a nonadjectival form Possibility is a substantive in form but an adjective in intention It is an abstract noun in the context of abstract discourse But it is difficult not to hypostatize into a full-fledged object a word capable of parading under the form of a substantive. Hence the leap from substantivization to hypostatization Here if anywhere Occam's Razor may be profitably employed That instrument is remarkably efficient in decimating entities produced by discourse But it must be used with caution Wielded by an unscrupulous barber, its sharp edge may cut off too many venerable beards The language of philosophy, shorn of hoary notions, is in danger of becoming jejune Besides, the habit of paring away entities seemingly otiose creates the illusion that nature is as cleanshaven as the intellectual system based upon the principle of parsimony Nevertheless, the endeavor to avoid reifying possibility is worth making The importance of the idea of possibility in the life of reason lies in the fact that it is not convertible into a "thing"

I intend to give to the term "possible" a sense strictly adjectival.

I shall devote my essay to the demonstration that "objects" may be described either as actual or as possible, the former if they have being, the latter if they are only capable of being The "possible" designates, as I shall argue, not "being" but "capacity for being" latent in the actual" Both these adjectives, actual and possible, have elastic meanings, depending upon the criteria governing the use of the term "being" under specific conditions in different contexts If sensible presence, for instance, conditions the being of an object, the object is actual if sensibly present, possible if it has the capacity to become so present Or, if the standard for the being of an object is its inclusion in the system of bodies or events as interpreted by the categories of physics, what is thus included merits the appellation of actual what is capable of being included there becomes possible Again, if the being of an object consists in the occurrence of predicted consequences resulting from directed operations, it is actual when the expected consequences occur, possible when such consequences are viewed as capable of occurring Make the vastest generalization of all, and say that being is identical with thought, then an object is actual if conceived and possible if only conceivable Whatever being signifies—and its capacity for different significations makes possible different theories of being—that which is said to have being, in the specific sense in which the crucial term is employed, is actual, and that which may be, in the same context where the actual is, becomes possible The definiteness of the adjective possible thus rests upon two considerations In the first place, it must refer to a context where something is actual, for it is only in such a context that the distinction can be made between what is and what may be How, for instance, can we speak of a sensation or a stimulus as possible unless in nature or behavior it resemble the sensations and stimuli that are actual? As Mr Church has shown (in connection with judgments that differ in modality) actual and possible objects cannot present a difference in "essence" A possibly hot sensation or stimulus must be, in "hotness," similar to or identical with that exemplified by an actually hot sensation or stimulus Impossible are precisely such experiences or events as are incommensurable with their actual prototypes In the second place, however, what is actual varies from context to context What is actual in the context of sensations, for example, differs from that which is actual in the context of stimuli The manner of being

which is ascribed to the feeling of heat is not the same as that imputed to the heat of the fire And if one theory of being succeeds in defining what is actual in all contexts, we may oppose to it another theory proffering a totally different definition Anyway, we are obliged to recognize variation in the meaning of the actual, either with respect to the particular situations in which it is an ontological predicate or with respect to the rival hypotheses in which that predicate is generalized in incomparable ways

To some extent I have already stated my thesis, namely, that whatever the actual means, and however heterogeneous the contexts in which it appears, the actual is prior to the possible as its source and fulcrum For this general position I shall now proceed to sketch in detail the argument

Consider first of all the strange equivocation attending the adjective possible I take for granted that a term is meaningless if we are unable to contrast it with its opposite What is the opposite of the possible? Is it the actual or is it the impossible? In some curious manner, the possible is in opposition to both Of the possible we can neither say that it is nor that it cannot be For example, I may die from pneumonia at any time It is an occurrence that has not occurred, for I am still alive, and my lungs are unimpaired, and in this sense my demise is nonactual, but my lungs are capable of becoming inflamed past cure, hence an untimely end from pneumonia I can never rule out as impossible The example, I think, is typical. However we *explain* the eventual, whatever conditions or causes or reasons we invoke for it. when we *describe* it as possible we mark it off from the actual on the one hand and from the impossible on the other Nor is this peculiar to events Anything characterized as possible—a non-Euclidean geometry, an infinite collection, a universal reason—must have the same double contrast to the actual and the impossible, for we should not speak of it as possible if it were actual, and we could form no conception of it if it were impossible Without this dual contrast the adjective possible becomes a gratuitous impertinence. Things are either actual or impossible There is no other alternative.

The adjective possible, if we are to use it at all, must be employed in a hybrid sense It is essentially epicene It designates something which is neither fish nor fowl What we think of as possible falls, as it were, between two stools; it is neither actual nor precluded

from becoming actual But the mongrel character of the possible gives rise to serious ambiguities For we may emphasize either its *opposition* or its *affinity* to the actual If the former, the distinction between the possible and the impossible becomes attenuated. for the impossible, too, is nonactual To describe something as *merely* or *only* possible, with the accent falling on the adverb, is to exclude it definitely from the realm of the actual And if we lay stress on its kinship with the actual, the possible becomes virtually actual, for to speak of something as *really* or *genuinely* possible—and here too the adverb is important—is to make another distinction without a difference What is really or genuinely possible is the actual just around the corner This, of course, is the fate of every term which is amphibolic It may be made to hold with the hare or run with the hounds

This is not satisfactory We cannot allow the possible to have one foot in the actual and the other in the nonactual One foot must be amputated But on which is the surgical operation to be performed? To sever the possible from the actual is to merge it with the impossible To an inveterate dialectician such a radical expedient would not be repugnant If the possible is the nonactual, how could it differ from the impossible, which is likewise nonactual? I am reminded of the shrewd remark by Tweedledee "If it was so, it might be, and if it were so, it would be but as it isn't, it ain't That's logic " That's logic indeed! The possible and the impossible, both falling outside the actual, must disappear into each other, if the law of the excluded middle is not to be impugned What isn't simply ain't The operation is successful but the patient has died Nothing whatsoever is any longer possible What I falsely deem to be so, an earthquake in California wise leadership in Washington, a new economic order in the world, lying as it does in the sphere of the nonactual, might just as well be dubbed impossible, since the actual and the nonactual are contradictories, and no middleground between them can be logically admitted Impossible, too, is my future death, if the predicate nonactual may be legitimately applied to it Thus may dialectic assure me of life everlasting. Clearly, such a view which turns the possible into its opposite, is a desperate *tour de force* The law of the excluded middle may effectually jettison an inconvenient adjective, but in doing so it comes close to verging upon nonsense No dialectic can make me believe that a

future event or a conceivable state of affairs is impossible because nonactual Between the possible and the impossible the line must be sharply drawn if all good sense and all sound science are not to go by the board

What we must do is to cut off the other foot. This alternative operation has the effect of establishing an intimate relation between the actual and the possible What is possible can never coalesce with the impossible precisely because it "communicates" with the actual But here two views are open to us Either adjective may be endowed with priority What is actual may be derived from the possible or what is possible from the actual In order to defend the latter view I must show why I regard the former as untenable

The contention, such as Leibniz advanced, concerning the priority of the possible over the actual, is familiar The actual world, as Leibniz held, was selected by God out of an infinite number of possible worlds open to God to create The world we call actual might have been otherwise, that in fact it is not otherwise must be attributed to the choice which God made among the many possible worlds known to him in advance of creation And since God's choice was determined by his goodness, a better world than the actual must be rejected as inconceivable If God could have conceived a better world he would have been under moral compulsion to create it. Since God had present to his mind countless possibles, we must conclude, relying upon his wisdom, that he chose to make actual the best of all possible worlds

This speculative hypothesis may be challenged on various grounds. For one thing, it presupposes cognitive intimacy with God and his ways Great indeed must be our knowledge of God to reconstruct his primeval state of mind in the presence of a galaxy of possible worlds If we disclaim knowledge of God, after the manner of Kant, we render worthless the assertion that the actual world resulted from a deliberate choice among mere possibles. For another thing, the hypothesis presupposes that the actual world is a single entity about which we can make valid judgments. Here, again, if we follow Kant, and take seriously his antinomies, we may repudiate any theory whose object is the totality of all phenomena. And as for the optimism involved in the relation of the actual to the possible, who could not on a priori grounds reach the opposite con-

clusion? Imagine a diabolical Creator whose task it was to produce the worst of all possible worlds It would take but little ingenuity to prove that the actual world is in conformity with that design And unfortunately, the rational proof could be strongly buttressed with empirical evidence

With all this I am not concerned What I wish to show is merely that the priority of the possible is a principle that Leibniz could not seriously defend as universal Either he must posit something actual as prior in violation of the principle or the principle will give us so many possibles that we shall suffer from an embarrassment of riches The principle of Leibniz resembles the magic formula which plays so much havoc in the *Sorcerer's Apprentice* of Goethe A competent magician is required to control a principle which, if not checked, would automatically keep on producing possibles For the actual world, according to Leibniz, resulted from the choice which God made from all the possible worlds present to his mind The world was merely possible before God elected to make it actual Yet prior to all the possible worlds the theological fable assumes as actual the mind of the Creator surveying and appraising them Actual was God But this actual God, once we suppose that *whatever* is actual is the result of a choice among possibles, must be likewise regarded as the best possible God chosen from an infinite number by a higher divine being And that higher being, by the same token could not be actual unless preferred by a still higher being, and so on *ad infinitum* with a vengeance! This follows ineluctably if we extend universally the principle that the actual is a created possible Why did Leibniz limit the application of his principle? Why did he not deduce an actual God from all the possible gods by the same mode of reasoning which induced him to derive the actual world from all the possible worlds? His imagination was certainly not inadequate for the task Apart from religious scruples, for Leibniz was not unorthodox, the bugbear of an infinite regress stared him in the face In the presence of an infinite regress the rationalist invariably experiences vexation of spirit; he shrinks from it as if it were poison, preferring to set an arbitrary limit to the extension of his principles brandished as "universal" To avoid an infinite regress we are asked by Leibniz to take with a grain of salt his assertion that the possible is universally prior to the actual, the validity of the assertion rests upon our

willingness to make an exception of a particular actual But if we refuse to do this, and accept his principle as truly or strictly universal, then anything actual, be it a world or be it a god, must be interpreted as having its origin in the possible If possible worlds, then possible gods and possible godheads and possible super-godheads and so on, but if something actual is assumed as prior, then the possible loses at once its primordial status

I have alluded to Leibniz, who in so many ways sought to establish the priority of the possible, in order to disclose an inevitable dilemma The argument for the priority of the possible leads either to contradiction or to infinite regress, to the former if it involves something actual as prior, to the latter if it is extended to everything actual If we disregard the theological myth, and take seriously Leibniz' argument drawn from the human level, the difficulty is no less apparent It is true that thought can think what it pleases, save that which implies an absolute contradiction, and in this sense the field of the possible is wider than that of the actual But this by itself could not guarantee the priority of the possible, it would only prove that the realm of thought is more extensive than the domain of fact The principle of "sufficient reason," dominating the actual and legislating for it, is a principle derived from thought, we are thus assured in advance or a priori that the possible revealed by thought is the genus of which the actual is a species It is the theory that the actual must conform to principles having their origin in pure reason which furnishes the deduction for the priority of the possible But here, too, there is a dilemma It may be stated in this form The possible, which is by definition the thinkable, is meaningless unless we postulate some thinker capable of thinking it Is the thinker actual or possible? If an actual thinker is requisite for thinking the possible, his priority contradicts the assertion that the possible is universally prior to the actual, the actuality of the thinker being the exception which disproves the rule. But if we assume that the possible is to be thought, not by an actual but only by a possible thinker, the thinker becomes one of the possibles, thinkable by another possible thinker, and so on *ad infinitum* The truth is that Leibniz could not eschew the actual without reducing to absurdity his contention that the possible is absolutely prior to it What relieves the contention of absurdity is the surreptitious bestowal upon something actual of the illegiti-

mate privilege of primacy The paradox discerned is not peculiar to Leibniz In whatever form the same contention appears, something actual, I feel sure, lurks somewhere in the background The possible, when completely abstracted from everything actual, bears a striking resemblance to the grin of the Cheshire cat without the cat

Those intent upon maintaining the priority of the possible must in the end run up against something actual as primordial Why not admit openly what we are obliged to concede clandestinely? The possible, as I see it, in order not to become synonymous with its antonym, must spring from the actual and must be capable of returning to the actual For that which can neither originate nor terminate in the actual is precisely what we understand by the impossible

The roots of the possible are in the actual Consider at random a few uses of the term possible If we look upon the possible as the conceivable, we tacitly assume actual minds capable of conceiving it, for a conception no actual mind could entertain we do not hesitate to reject as impossible Is the possible the perceptible? Here, too, the reference must be to actual minds, the impossible being what no actual percipient could ever encounter If we regard the possible as the inferable, we at once relate it to the actual, for no inference can take place unless it proceed from an actually observed event or an actually conceived theme, and that which could neither induce nor consummate an actual process of inference we should be obliged to throw out of court as impossible Is the possible an event capable of occurring? We must think of it as conforming to the conditions and laws governing actual occurrences, for an impossible event would be teratogenic, one incompatible with the modes of genesis and ways of action typified by phenomena preempted as actual in the different contexts of the natural sciences We may define the possible as we choose, but we cannot eradicate the actual from our definition They reckon ill who leave it out Without reference to the actual as the *fons et origo* of the possible, the possible simply coalesces with the impossible.

Nor is the actual merely the source of the possible The actual is also its ultimate goal. We must envisage the possible as a prospective actual, and in this again it differs radically from the impossible What we believe to be impossible, whatever our grounds for so believing, falls outside the pale of the actual It is something

which we assume can never be Its fate is sealed We discard it as unrealizable Of the possible, however, we only think as unrealized. Although it is unrealized, and in this sense not yet actual, we have no scruple in feigning the possible as eventually actual This tendency to feign is inexpungible from its notion What we designate as possible becomes projected on the screen of the actual The conceivable, for instance, is what the actual would be if it could be made responsive to the demands of pure reason. Metaphysicians have had little difficulty in reconstructing the actual in conformity with their supposititious conceptions What we conceive is actual in a putative sense The perceptible, if this be the meaning of the possible, is what the actual would be encountered as being in the presence of imagined percipients Apart from Kant's doctrine, in which the possible is but the actual anticipated, we have the cognate and simpler theory of Mill under the name of "permanent possibility of sensations" And no other view of the possible can avoid thinking of it as a foreshadowing or prefiguration of the actual. The inferable is the actual as inference predicts it, and what may occur is an actual occurrence in prospect Neither science nor morals can dispense with the possible as the hypothetically actual. It is the destiny of the possible, in any of its uses, and in all, to be conceived as an emergent actual It frequently does emerge as actual, and then its manifest destiny is fulfilled, but even though frustration be its lot, the possible is always what under different circumstances might have been realized What might have been, for a speculative mind, is as significant as what is or what may be The possible, though unrealized, must always be endowed with the prerogative of being realizable And if for any reason it cannot be so endowed, the possible can no longer be contrasted with the impossible

The notion of the actual is thus prior to that of the possible, for without the actual as its basis and fruition, the possible vanishes into its antonym—a paradox to be eschewed in the interest of sane thought and practice Since the possible so easily shades into its opposite if not thought of as imbedded in the actual, we must give it a name which will readily suggest its local habitation. Accordingly, I venture to designate the possible as the coactual The following elucidations will show, I hope, that the new term is more than a convenience in locution

The new term makes explicit what the possible always implies, namely, relativity to the actual If we could agree to use the word possible in its etymological sense, a new name for it would not be required What I mean by the coactual is what the actual is capable of being Capacity to realize alternative potencies or tendencies is an integral part of the actual Capacity is immanent and not transcendent It is the immanence of capacity which enables us to speak of the possible and the actual as "cohabiting" together in the same context (if I may be allowed to play upon a word) Here, for example, is a piece of sugar in its solid state To think of sugar as soluble is to regard as coactual with its solid state a quite different state which it is capable of realizing Solubility, in this example, is a possible always copresent with actual solidity How and why it is so copresent I do not know until I consult science and ultimately some type of metaphysics But neither science nor metaphysics can remove a capacity from the thing in which it inheres A capacity is what a thing *has,* and so far as its *being* is qualified by its characters and relations the characters and relations it is capable of displaying belong to its nature as much as those which it actually makes manifest When sugar appears as solid, its capacity to be dissolved is immanent in it although eventual dissolution be indefinitely deferred Here a possible state is clearly coactual with an actual state What holds of sugar holds of anything and everything having capacity My capacity to die is immanent in my vital functions as much as solubility is immanent in the present solid state of a substance However I circumscribe my own actuality, so far as I include in it what I am capable of being and doing, the capacity to die belongs to me no less than the capacity to speculate on the problem of possibility Purely verbal is the dialectic which can find no middle ground between the actual and the nonactual The possible state which I call my death, like the possible dissolution of a solid thing, is neither actual nor nonactual It is coactual It has not occurred but it is capable of occurring *Media vita in morte sumus* Capacity, I believe, is a sort of middle term between the actual and the possible The possible is a visioned actual the nature of which is determined by the capacity lurking in the actual. Whenever I think of the possible, such as the conceivable, the perceptible the inferable, the occurrable, I envisage something eventual—an eventual conception or perception or inference or occur-

rence—resulting from a liberated capacity immanent in the actual The imminence of the eventual, near or remote, which distinguishes the possible from the impossible, is determined by the immanence of the capacity conditioning it, the relation of the imminent to the immanent, a relation that defines the exact status of the possible, prevents us from designating the possible either as actual or as nonactual The impending, though manifestly not actual, is coactual, because of the capacity latent in the actual which adumbrates its essence and behavior

I am not unmindful that Mr Adams has with much acumen distinguished alternatives from tendencies and both from capacities Alternatives and tendencies, I hold, presuppose capacities Without arguing the point, and accepting as valid the distinctions drawn by Mr Adams, what I wish to urge is that alternatives and tendencies are likewise relative to actual situations, as the illustrations evoked by him sufficiently show, and that apart from such situations no meaning can be attached to them What are alternatives, and where do they dwell? There are, of course, no alternatives as such, and they do not exist or subsist in splendid isolation Alternatives are divergent ways in which actual minds or actual things may move or function or may be made to move or to function What these divergent ways are depends upon the contexts to which they are pertinent Thus, in one context we may speak of alternative hypotheses or conceptions, in another of alternative interests or practices, in still another of alternative movements or effects Whatever the contexts, alternatives are imminent eventualities conditioned by divergent capacities immanent in the actual They are as immanent as a capacity assumed to have no rivals I suppose, to revert to my former illustration, that to my eventual death there is no alternative, but in the manner of my dying I can contemplate various alternatives, each connected with the vicissitudes and conditions to which my organism is subject, and each, therefore, coactual with my actual life, provided I am able to relate it to a separate and specific capacity. That is why I feel concern if any part of my body is diseased or exposed to danger I do not know when and where the blow may strike me I am vulnerable in sundry ways, and it is vulnerability—a multifarious capacity—which makes alternative forms of death coactual The situation is the same whenever alternatives present themselves they are due to

capacities immanent in actual contexts, each coactual *with* the contexts, and each capable of becoming actual *in* them I frankly do not know what alternatives are that can neither originate nor terminate in actual contexts (of which thought or discourse is a particular species) What is true of alternatives is so obviously true of tendencies that the point needs no stressing What are tendencies if not relative to contexts in which they are incorporated? Where are they apart from actual objects or situations capable of manifesting them? Something tends in this direction or that because of some inherent capacity Whatever be the differentia of tendencies, they are a species of imminent eventualities determined by immanent capacities They are coactual with the actual

The term coactual, by which I designate the possible, suggests further that the possible is always an alternative actual Whatever any actual is, we may compare or contrast it with the actual that it is capable of being Even if I relate the possible to a single capacity, the possible state of a thing is the alternative of its actual state Sugar is soluble When present as solid, its solubility is not actual but possible And because sugar is capable of being dissolved, I regard its solubility as coactual with its solidity But the capacity of sugar to be dissolved foreshadows an eventual state competing with its actual solid state The coactual, being the rival of the actual, may become the actual, and when it does, an alternative has triumphed and taken possession of the field The example, though simple, is typical When we consider situations more complex, the status of the possible remains the same My nature, for example, is undoubtedly more complicated than that of a piece of sugar Yet, if I distinguish between what I am and what I might have been or may be, I have a situation comparable to that of actual solidity related to coactual solubility Coactual with my actual interests and activities are other interests and activities for which I assume I have the capacity, when I think of all the possible professions or vocations I might have followed or may still pursue, I simply project in the past or in the future alternative ways of being actual. Alternative fashions of being actual, imagined or desired, haunt like ghosts the actual life I lead; and any of these, given a will and propitious circumstances, might have assumed or may yet assume substantial form. But, alas, these alternative modes of being actual, unlike the eventual dissolution of a solid thing, remain for the most

part unrealized! This, however, has nothing to do with the case For the status of the coactual is defined by an appropriate capacity in advance of its realization Coactual is not dissolution, but solubility Realization, if and when it occurs, transforms the coactual into the actual What has eventuated is no longer imminent The soul of the possible is not in eventuation but in the capacity for it, when such capacity is paralyzed the possible is what might have been, when still dormant the possible is what may be There is no avenue to the possible, either as a supposititious or as an impending alternative of the actual, save through discernment of capacity immanent in the actual

There is a saying that coming events cast their shadows before them The simile is beautiful but misleading The image of bodies attended by shadows is inapplicable to events that have not occurred The image is an apt one if we modify its sense. It is the actual which foreshadows the eventual Prior to eventuation, the eventual, however certain its imminence, is only what the actual portends, a portent, whatever its justification, is still a denizen in the realm of the impalpable One thing, for instance, is the actual dissolution of solid sugar, quite another thing is its capacity to be dissolved The shadow here, if we wish to retain the metaphor, is an alternative state which the solid substance casts before it, an alternative state imminent but not eventuated What is true of solubility when dissolution has not occurred, holds of everything said to be possible What is coactual with the actual, a foretokened alternative actual, accompanies the actual like a shadow The metaphor of a shadow is, of course, inadequate, for a shadow has not the ghost of a chance to be anything else Nevertheless, it suggests a constant companion attending a substance The omnipresent concomitants of the actual, the possibles that it projects, are more than shadows, they signify what might have or may become actual, actual in retrospect or prospect, always competing with the situation which the French so significantly label as *actuelle*. Any situation we regard as *actuelle*, be it economic or political or moral or physical, may be measured by what it is capable of being; what it is capable of being is coactual with its present nature, and upon this rests the hope or the fear that the possible will become the eventual, replacing the actual now in vogue.

But the term coactual, besides suggesting that the possible is

relative to the actual and an alternative of it, serves also to emphasize the continuity of the possible and the actual It is not an eventual state, I must reiterate, which is immanent in an actual state, but only the capacity to realize an eventual state Accordingly, what in any context is possible, depending as it does upon the specific capacities latent in it, cannot be unrestricted Not everything is possible in every context We cannot milk a he-goat. We cannot weave a rope of sand By taking thought we are unable to add one cubit to our stature These assertions intimate that certain eventualities are precluded simply because the capacities requisite for their realization are not present. The presence of specific capacities determines what in any given context has a chance of becoming eventual Without presupposing specific capacities, "all trees," as Lucretius said, "might avail to bear all fruits" It goes without saying that the relation between capacities and eventualities involves causal factors, and that reliance upon causal factors rests ultimately upon unproved and unprovable postulates But this is another story How or why certain eventualities do or do not result from certain capacities constitutes a separate inquiry What I chiefly wish to lay stress upon is only this that eventualities, being but prospective or projected actualities, have no *locus standi* apart from the capacities present in the actualities that are given or assumed Hence the continuity between the actual and the possible The possible is the imminent actual presaged by an immanent capacity, appropriate capacity in the actual is thus the sole criterion for the affirmation or denial of the eventual Let me illustrate this by a stock example Are round squares, those mock entities dear to philosophers, possible or not? The question is meaningless if we do not specify the context where such objects are either capable or incapable of being In the context of physical things these objects are precluded from becoming eventual And why are they thus precluded? Because, we must reply, the capacity for producing or manifesting them is absent from the physical world which science considers actual The capacity to realize round squares is simply not immanent in the context with which physics is concerned, therefore their imminence is not coactual with the actual world From the context of mathematics, these objects are likewise excluded either because the capacity is absent for their construction or demonstration or because the domain of mathematical entities

is incapable of harboring them without violating the principles governing that domain Here, again, round squares are impossible; they are not coactual with the world of objects which the mathematician designates as real or existent (in the special sense in which he employs these adjectives) And when a man tells me that round squares are possible because he can imagine or conceive them, what he reveals is just his peculiar ability Capacity to entertain objects which neither physics nor mathematics can tolerate is the only ground for endowing them with coactuality Round squares may indeed be possible in the context of a man's fancy, and in that context alone regardless of the fact that another man would stigmatize such entities as monstrous The point is that what in any context is deemed possible refers to a specific capacity as its condition *sine qua non* Given the actual, and the determinate capacity inherent in it, and then, and then only, do alternatives to the actual arise, and these alternatives, though they may never be realized, are continuous with the actual, provided the capacity to which they are related either permits or does not forbid their eventual realization

What is possible is thus relative to the actual, competing yet continuous with it These three aspects the possible owes to its dependence upon the capacities possessed by the actual But the possibles which capacities foreshadow are peculiar objects We cannot deny them actuality nor can we affirm it of them They are like unborn children that parents could produce Prospective children are subject to the same conditions of generation as actual ones, and when these conditions are present their eventual appearance is not precluded Many a man orders his life in view of the possible heirs to his name or fortune And when one speaks of future populations, as statesmen and economists are wont to do, the reference is obviously to unborn souls whose claim to possibility is based upon nothing else than the capacity for creating them pertaining to actual men and women Here the possible is the unborn but the generable Elsewhere, too, this is what the possible means. It is always something unborn or unrealized but considered generable or realizable Every possibility, foretokened as it is by capacity, is (if I may vary the metaphor) a sort of promissory note of which we can say that it may but not that it will be redeemed To be or not to be actual—this momentous alternative defines its true status. And like a promise, even when honored in the breach, the possible

is such a concomitant of the actual that the designation of it as coactual seems not inappropriate

For me, then, the problem about the possible is ultimately a problem about the actual. What is the actual, and what are its capacities? Until we essay an answer to this question, we are unable to determine the nature of the possible or to trace its limits If, as I hold, the possible is a concomitant of the actual, and nothing apart from it, the notion of the possible must vary with the notion of the actual The context in which the actual is constricted will provide little or no room for the possible Where the actual is plethoric, the possible will be correspondingly profuse The range and scope of the actual dictate the range and scope of the possible

This may be readily exemplified by a brief mention of two extreme views of the actual—the infinitesimal and the infinite

The infinitesimal theory is that which identifies the actual with the deliverance of the specious present How can that deliverance suffer anything possible to be its concomitant? In the "solipsism of the present moment," to use Mr Santayana's expression, the possible has little place or relevancy What is immediately given here and now is absolute in its actuality vouchsafing nothing else and nothing more than its own solitary appearance If the actual coincides with the content of a single intuition, how absurd to join to it as coactual what it might be to another intuition or what it may consort with in an external medium! Its total actuality is exhausted in its occupancy of the momentary scene Yet, if we interpret the momentary scene as a "specious" present, as a minute tract of time, fading at one extreme and budding at the other the forward end of that tract may *à la rigeur* be taken as the tiny region in which what was but imminent before becomes eventuated As long as the actual occupies a unit of time made up of two directions, coactual with it is what it is capable of being in the impending part of the specious present So even in the specious present, if imbedded in its nature is an element of futurity, the coactual is yoked to the actual, however microscopic both the actual and the coactual are conceived to be

At the opposite pole is the infinite theory, the one which so widens and expands the actual that it coalesces with the "whole" nature of things The "total" nature of things, which is not an impossible conception, seeing that many philosophers are capable of entertaining

it, must obviously include all its capacities and therefore all unrealized possibilities Endless time, in which the "totality" of things is deployed, guarantees an inexhaustible supply of possibles, on the assumption that the possible prefigures the eventual, and that the eventual, though continuous with the present, always lies in the bosom of the still absent future It is beside the point to invoke an omniscient being to whose consciousness the illimitable universe would appear as a *totum simul* Such a being, though knowing in advance the fate of all the possibles, could not deprive them of their coactual character, if it is the destiny of possibles to be realized or not to be realized Leibniz, for instance, who endowed the Creator with the capacity to know and to create all possible worlds, was obliged to assign to the actual world a preactual status, the status of a possible to which actuality might not have accrued if it had not recommended itself as the best The Creator's omniscience, which presumably included the foreknowledge of his ultimate choice, did not prevent the chosen world prior to creation from trembling in the balance Time was when the actual world was coactual only And the worlds that the Creator did not create, but might have created, are they not on Leibniz' hypothesis coactual still? They are eternally present as unexecuted plans in the imagination of the Supreme Monad The theory which reserves the term actual for the universe, whether or not an omniscient being is presupposed for the knowledge of it, must needs postulate as concomitant with it the infinite possibles which in endless time may either become eventual or forever remain in the limbo of thwarted capacity

Both these views, the infinitesimal and the infinite, show that the extent of the possible depends upon the extent of the actual In the least imaginable context, that of the specious present, little is possible because the actual there is so homeopathic The context of the universe, the greatest conceivable, is super-saturated with possibles, containing as it does infinite capacities and endless time in which to realize them I do not wish to make light of either alternative Both are possible in my sense of the term, in the sense of reflecting the capacities of actual philosophers. But neither view enables us to locate the actual The specious present is truly specious and the infinite universe is too inclusive In neither context is the actual significant Reduced in scale to the twinkling of an eye

in one and inflated without limit in the other, the actual becomes a term which is, strictly speaking, undenotable

The actual which we can and do denote presupposes finite contexts (if by finite we understand what is neither infinite nor infinitesimal) marked off from one another by frontiers however vague or tenuous The actual signifies nothing until we qualify it When it is qualified, we know what to look for and where to find it Who can indicate objects that are actual without qualification? Actuality as such is an empty word, the actuality that objects rejoice in is carmarked, as it were, such as empirical, historical, physical, mental actuality Their actuality, if I may say so, is idiomatic We must identify the *locale* of objects before we can either affirm or deny their actuality Suppose I am asked whether thoughts are actual To a question of this kind I for one should not know how to reply What thoughts, I must ask in turn, and in what context? If some thoughts are specified, what sort of actuality am I expected to ascribe to them? The logical actuality of thoughts, by which I mean their consistency, is not the same as their psychological or historical actuality To Abraham Lincoln, for example, a biographer often attributes thoughts that possess both logical coherence and psychological verisimilitude, but the historicity of these thoughts may be disputed either because documentary evidence for it is lacking or because no amount of such evidence can vouch for the accuracy of judgments concerning a man's inner life A biographer, in feigning to reveal the "actual" thoughts of his subject, does not adhere to one set of assumptions and criteria, for in default of strictly historical evidence, he does not hesitate to avail himself of proofs which are either logical or psychological The matter is complicated But, clearly, thoughts cannot be looked upon as actual in unequivocal fashion Whether thoughts are actual or not hinges upon the meaning we give to the crucial adjective and upon the tests justifying its employment And is it otherwise with events or occurrences? Can we unambiguously speak of them as actual? Everything depends upon whether the events or occurrences meant are physical or mental or political or qualified in other ways Events actual in one context may be nonactual in others Dreams certainly happen We cannot deny them psychological actuality Yet physics and history may safely extrude them from their domains The same is true of everything else judged to

be actual It can be so judged only with reference to a finite context And what we view as actual in a given situation involves assumptions and criteria the validity of which does not extend beyond the context where they are brought into play For example, the assumptions and criteria upon which the physicist depends for the determination of what he considers the actual are not the same as those invoked by the historian or the psychologist or the sociologist All this I take to be indisputable

How many finite contexts are there? What is the relation between them? Is each context *sui generis?* Or should we endow with primacy a chosen context, holding the others to be derivative? These questions are fundamental The answers to them define our metaphysical loyalties In the typical ontologies we shall find the ineluctable dilemma between pluralism and monism either autonomy of diverse contexts or hegemony of one over the rest The pluralist does not find multiplicity disconcerting; the super-synthesis of the "many" into the "one" seems to him a work of supererogation The actual specified in one context he refuses to translate in the terms of another Plural sovereignty is a principle that he does not view with horror What he finds repugnant is the monolatry of the monist For such monolatry cannot avoid begging the question of priority The principle of reduction, which dominates the monist, is useless until a choice is made of that context to which all the other contexts may be reduced But the choice of such a context appears arbitrary If this were not so, we should not have the perennial strife of ontological systems, each selecting as prior a finite context in which the actual enjoys a specific meaning, such as the logical or empirical or physical or psychological, and then drawing to its scale whatever is found to be actual in every other context But I need not expatiate here on the question of priority. I have dealt with it at length on previous occasions I can only repeat what I have said so often Allow me to choose any context as prior, and permit me to interpret its priority in the terms of a particular ontology, and I will undertake to show how every other context may be made ancillary to it

But not being monolatrous, I have no desire to seek for a single and all inclusive context. I am willing to accept as irreducible a plurality of finite contexts in each of which the actual has a definite significance in relation to special assumptions and criteria. The

discernment of these contexts is the task of philosophic analysis, and the interpretation of their scope and concatenation is the work of philosophic criticism Contexts, though distinct, are not unrelated Mathematics and history, for example, are certainly irreducible to each other, yet mathematics may become the subject-matter of history, when its genesis and development are topics of inquiry, and historical events may be viewed as amenable to numerical determination In spite of the mutual accommodation of contexts, what is actual in each remains indefeasible One thing is the logical actuality of Euclidean geometry which I take to be its validity, another thing is its historical actuality, when considered as an event in Greek culture And few, I suppose, would be rash enough to think of history as a branch of mathematics because numbers may or must be employed in the description of occurrences The same is true of other distinguishable contexts Physics and psychology, though likewise in mutual coaptation—for otherwise the two could not be so completely fused or confused either *à la* Berkeley or *à la* Watson—represent contexts in which what is actual in one remains incommensurable with what is actual in the other No passion for unity can make me mistake the actuality of the mental act of perceiving for the actuality of the physical thing perceived, and vice versa Why should one kind of actual be expected to display characteristics peculiar to another? It is only monolatry, the worship of a single context, which leads to wanton denial or suppression of everything not lending itself to inclusion within the framework of a favored system of actuals

The typical contexts in which the actual appears, such as discourse, mind, experience, history, nature, the philosopher does not make He finds them ready made and "going concerns" "A philosopher," as Mr Santayana somewhere remarks, "is compelled to follow the maxim of epic poets and to plunge *in medias res*" He can only discriminate and interpret the extant contexts in which the actual acquires different qualifications He has no access to the actual except through these contexts If he turns his back upon them, wishing to start *de novo*, the only context he may explore is the infinitesimal one of the specious present He may indeed choose not to forsake that context, preferring to abandon himself to skepticism or mysticism, either or both of which the identification of the actual with the immediate brings in its train But a philosopher

who has some faith in the intellect and in things not immediately given finds his thirst for the actual unquenched by the homeopathic dose of it which the specious present furnishes His escape from skepticism and mysticism lies in quaffing without scruple what finite contexts provide Metaphors aside, a philosopher who is aware that the equation of the actual with the immediate leads to an impasse, will take as basis for his criticism and construction the actuals such as the larger and diverse contexts supply and specify He may distinguish an irreducible number of them, and the recognition of their irreducibility will render him an adherent of pluralism Or he may arbitrarily invest with primacy one of the discerned contexts, yielding to the seductive power of the principle of reduction to establish his particular brand of monism At all events, the actual is what it is qualified as being either in several contexts or in one chosen as privileged

The relevance of all this to the possible is obvious What holds of the actual holds of the possible The possible, being the coactual, belongs to the context where the actual is The pluralist will extend recognition to many types of possibles in accordance with the irreducible contexts that contain them as capacities The monist will acknowledge as "real" or "genuine" only those possibles which are involved in his cherished context This may be epitomized by the customary and important division of possibilities into real and unreal or (to use Mr Adams' expressions) into genuine and spurious ones What are unreal or spurios possibilities? From the monist's point of view, such possibilities are ultimately impossibilities, and they had better be called by that name For real or genuine are the possibles falling within the compass of a context selected as prior, the possibles in other contexts are either reducible or irreducible to them, if reducible they at once become real or genuine, if irreducible nothing can save them from joining the ranks of absolute impossibilities The monist, because of his absolutism, is compelled to turn a useful distinction into a stark dichotomy. For his possibles are either real or unreal, but never both And by "unreal possibilities," an expression which is redundant and self-contradictory, he means not possibilities at all but rather their antonyms For the pluralist there is a sense in which, in spite of the law of the excluded middle, possibles are at once real and unreal, depending upon the contexts to which they belong. This is not

surprising in the light of his use of the term "actual" What he designates as actual is always relative to a finite context Is the other side of the moon actual? Yes and no In the context of physical things, both sides of the moon are equally actual, in the context of perceptible objects, one side only is actual and the other is not Are secondary qualities actual? Again the answer must be yes and no Actual in the context of perceptual experience, they are denied actuality in the context of classical physics These illustrations suggest that with reference to the actual there can be no dichotomy between the genuine and the spurious but only a distinction in relation to different contexts No object is actual in all contexts, the genuine here is the spurious there The possible as the coactual is as variable as the actual What is capable of being realized in one context may be ruled out as impossible from the standpoint of another If one is asked whether a thing is possible or not, the proper procedure is to demand mention of the context in which the thing is to be incorporated There is nothing for which possibility may not be claimed, provided some context admits it as coactual with the actual For the possible is but the actual in embryo lying in the womb of a context

Everything concerning the possible thus hinges on the meaning of the actual The nature and scope of the latter determine the character and range of the former For the possible is that which has capacity to be actual This constitutes its sole meaning Any other view threatens to obliterate its distinction from the actual on the one hand and from the impossible on the other In the end the concept of the possible remains epicene It is a concomitant of the actual and therefore distinct from the impossible, but since it is only capable of being, the possible must be spoken of as the-not-yet-realized and thus as distinct from the actual The term coactual, as a substitute for the term possible is perhaps misleading, since the accent falls rather on its positive than on its negative aspect But this is unavoidable in dealing with a concept so characteristically mongrel Science and practice warrant, however, a positive view of the possible Although the emphasis is positive, I must reiterate that the possible has no other habitat than the context in which the actual is definite and specific. The many contexts in control of the meaning of the actual justify a pluralistic theory of possibility I am led to recognize many kinds of possibles be-

cause I am bound to acknowledge finite contexts bearing witness to many kinds of actuals The crucial question ultimately turns upon the number and hierarchy of these finite contexts Here many hypotheses are possible, they all are capable of logical proof under the aegis of appropriate postulates or presuppositions. But the choice between them is quite another matter. According to my own hypothesis, verification of which belongs elsewhere, pragmatic considerations alone can establish the adequacy of any view regarding the order and connection of the finite contexts in which the actual and the possible cohabit together.

THE POSSIBLE AND THE ACTUAL

BY

EDWARD W. STRONG

THE POSSIBLE AND THE ACTUAL

EDWARD W. STRONG

I

PROFESSOR ADAMS STATED in the opening lecture that genuine possibilities are extensions of the actual, and added the dark saying that such extensions implicate the real The present essay is concerned with genuine possibilities and thus with the extending processes in which the possible is made actual Actualization requires performance, productive change, rearrangement, behavior, or function in some context or other We begin from the limiting conditions of some specifiable context The craftsman begins to shape his wood into a set of chessmen but cannot possibly begin to shape it into a loaf of bread The actual is the actual of, for, with, by, in, some context of subject-matter, the actual of some specification, the actual in some respect It is possible to travel to London, but we can only actually begin to do so from our present situation If we are on the way it is not necessary to go back to the origin of the journey, or to inquire how we got started in the first place, in order to get ahead Our possibilities are not discovered in our ancestors but in the going concerns even though these actual concerns were possibilities at a prior period The genuinely possible is a performable previous to being in performance or performed It is from performance through a continuation of performance that the possible is eventually actual My first task is to examine the state of affairs called the actual as the basis of an empirical and naturalistic account of the possible

Professor Loewenberg in his "Possibility and Context" establishes the actual as a pluralism of contexts If we ask what a man is, we can reply in chemical, physiological, biological, psychological, or social terms The Mad Hatter is actually in the story by Lewis Carroll, my heart is actually beating as I read these words, this is actually the fifth lecture on possibility Unqualified possibility is said to be meaningless, and qualification yields a contextual statement.

The actual, varying in meaning from context to context, is required for a discussion of the genuinely possible The impossible is defined as that which can neither arise nor terminate in the actual Thus the possible is said to be in communication with the actual, to be foreshadowed and prefigured in the actual, to be portended by the actual, to be coactual So far I follow Professor Loewenberg in his argument that the genuinely possible is realized as an "emergent actual" The difficulties in the way of further empirical treatment appear in the statement that the possible is a determinate capacity *latent* and *imminent* in the contextually actual The term "capacity" offers the *via media* between actual and possible, but if capacity is hidden in latency and imminency, the portent of the possible is in an actual the prophecy of which is spoken after fulfillment

We must know the determinateness of capacity if we are to speak of the possible as *foreshadowed* and *foretokened* by the actual. Determinateness of capacity is specified as limiting conditions Limiting conditions that limit do so actually, that is, here and now in whatever field is under discussion For example, the castaway on a desert island finds that the limiting conditions of his environment do not permit him to exchange his coin for bread The conditions are contemporaneous and distributive They constitute this rather than some other actual situation that might be specified Thus, limiting conditions appear to be another name for context If Robinson Crusoe is not to perish from hunger and thirst after finding himself cast upon the beach, he must enter upon some course of action We can say that the man and the environment imply this capacity for action, but since the man is alive and active within the immediate environment nothing need be provided as a condition for going on with further action In Defoe's story, each trip that Crusoe made to the wrecked ship resulted in a gain of tools and materials that widened the range of possibilities open to him in their utilization When Crusoe brought an ax to shore, the ax in hand had a capacity to cut, but this capacity was the ax in hand The cutting is a performable only actual in the times and places of performance We distinguish here between the dynamic and sequential processes and the composition and arrangement of an individual or a field If the latter is the context, the former is the history and I shall maintain that histories or performances are patent and explicit in the contextually actual

We can point to the actual but not to the possible The term actual has a denotative reference to the being and having in experience The latent and the imminent cannot be nor be possessed in experience without contradicting their significance If performance is not actual it cannot be visited upon the actual from the future possible nor will the future possible get realized if the actual is not capable of eventuating in what is considered to be a performable It is the future performable and not the past performed that challenges an empirical account We can now say that it was only in a world where flight was possible to men, that men have learned to fly Prior to the invention of air-machines there must have been a capacity in men and material for the actualization represented by the invention We can say "must have been" because such machines have actually been made How, then, did Leonardo da Vinci grapple with the notion of that which had never been actual before him and was not realized until long after his death? In concerning himself with the possibility of human flight, Leonardo studied actual flight in the bird and the bat Upon the basis of his knowledge of materials and machines, he constructed machines Flight, and man, and the conditions of making machines were all actual but the combination of a machine that would carry a man through the air was something to be realized Leonardo thus began with actual limitations, comparisons, and existent configurations We know that Leonardo was concerned with something genuinely possible, in a retrospective view from the actualized outcomes of his project

What of the prospectively possible? On the desk I have a packet of carrot seeds to plant in the garden I know what to expect of these seeds if they grow, since I know what carrots are, and I further know that these are carrot seeds It is only because seeds like these do grow that gardeners harvest a crop The actual seeds are possible carrots or have the potentiality to become carrots If we take the empirical position for better or worse we are obligated not only to say that the possible has no meaning except in connection with the actual, but are furthermore not permitted to smuggle in any metaphysical third parties This means that no ontological ghosts are allowed to minister the seed to the plant under the name of germinal power, entelechy, or final cause These ghosts have an honorific past and are apt to haunt an unwary empiricist

The seeds on my desk are only their actual present existence

They lack nothing to be actual If the meaning of the seed is what I can verify in respect to the objects before me. I can verify the present life and arrangement of the objects, but I do not see how I can now verify their future in my garden In this sense it is meaningless to speak of whether or not these seeds will be plants at some future time Also actual is my knowledge of mature plants from previous or present experience and I know that such plants grow from seeds of this kind Matured plants exert no obligation or compulsion over these seeds We discern the matured plants and compare them with seeds, but to attach priority to selected terminations and to read this termination into the seed as its purpose is spiritual teleology We find such a doctrine maintained in the metaphysics of emanation, in which the higher in being and goodness is causative of the sublunary, inferior regions Form is transcendent to its copies and to the corruptible matter which bears the imprint of the eternal signet We banish the operative end or final cause only to run the risk of the imminent vital form infolded within the mechanism of the seed If we treat the physical body as a Cartesian world of geometrical extension, and if we regard this mechanicalism as the last word on the actual constitution of phenomena, we may rush to a Leibnitzian rescue with an antidote of vitalistic monads We thus neutralize the acidity of the mechanical system with the alkalinity of the vitalistic The vitalistic cure would not be needed if the mechanistic system had not been swallowed without reservations When the actual is interpreted as exclusively mechanical, that is, as mere composition and arrangement of parts without respect for productive change, an occasion is afforded for the introduction of a vitalistic or energistic metaphysical principle When, on the contrary, the actual or existential world is mere flux and becoming, reality may be elected as a structure of eternal forms

As Professor Dewey has pointed out, the separation of a first from a final event in the same process throws the emphasis away from the process to the first or the final phase. If seed and plant are regarded as two separate parts requiring some causative connection or formal principle to get them together, the problem is one of logical treatment and not of natural process Deny such process as actually occurring and a logical treatment saves process with metaphysics or flatly denies its reality. In speaking of carrot seeds

and carrot plants we compare an earlier and later stage of similar process In comparison we recognize that the seed does not display the make-up of the plant This lack is nothing *in* the seed as a mysterious privation, for nothing is actually deprived to the seed if the other member of the comparison is removed The child is known to be father to the man because every adult was once a child. In the comparison, however, we are not pointing to the actualization of *this* seed or *this* child when we point to *that* plant and *that* adult The plant that *this* seed may become and the adult that *this* child may eventually be, are future events, eventuations of processes yet to come The lack of future process is no lack in present performance Without the comparison between earlier and later stages I should not be able to speak of what seed and child can become Without comparison I should have nothing to say about the determinate character of carrot seeds and children The potentiality attributed to the earlier stages in view of the later I shall call *potentia* Every student who enters school is a learner *in potentia,* meaning that in comparison with those who have learned he is seen to lack that which may be acquired by himself No examination of student or master taken separately and immediately will reveal *potentia* as something latent in the former and fulfilled in the latter The term as here used is not intended to stand for any privation of actuality, or mysterious agency in the earlier in order that it may strive to become the later When we compare actual seeds and children with actual plants and adults we are not comparing the actual performances of the earlier with *their* futures since *their* futures remain to be performed as an extension of the actual performances now going on

Turning, then, to the actual performance of the seeds, we remark that time will tell what the outcome of planting these seeds will be. What the seeds may be is what they can be, but this "can be" exerts no compulsion If we know nothing about the seeds except the fact that they are seeds, what they can become will be fully evident in the course of their life-histories and not before. Remembering the beginning at a later time, I can see the ability of the beginning in respect to what has emerged. This is again a comparative statement but it also involves the recognition of productive change displaying the sequences of growth This condition of being in performance I shall call *potestas* I do not attach to the term the notion of

a separate agent or moving power There is no need to separate the composition and arrangement of the seed from the living of the seed, but if we do so, it is easy to fall into the notion of a living force inciting the seed from within or shoving it from behind The *potestas* is then ontological, an inherent vitalistic impulsion which drives the actual into the future eventuation Where the matter which undergoes change is defined as inert, the form which makes the concrete individual is also the transformative principle which incites the process If one is an extreme realist the history of the seminal reasons is already written in the ideas in the mind of God No entelechy is required in a contextual theory where seed and child are taken in performance Nothing more need be added by way of internal principle or final cause to get the individual to grow if he is a growing individual No agency is needed other than being an agent No ontological form is required since the individual exists in character in order to exist at all Why existence should be in character is not a question that needs answer in order that individuals be known to exist as they do Kipling tells us why the camel got his hump and the elephant his trunk, but one wonders what a camel and an elephant were when they were not the animals they are

It is needful for logical classification to separate the order revealed through and in events from the events, but there is no need of hypostatizing the logic In natural performance each individual is acting and being acted upon No one has ever shown the form of wheat acting upon the grain to make it grow into a wheat stalk No one has ever verified an inherent generative force inciting and directing the process from within Both explanations separate from the grain of wheat its actual status as a living organism in order to explain how it can get out of its present into the future Where the grain of wheat is actually alive, in performance, it needs only that performance continued under favorable conditions to perform further No hypostatized concepts are required to say that this grain of wheat may become a loaf of bread, the loaf of bread may become flesh and blood, the flesh and the blood may speak. The future arrangements into which present events may enter do not lie in the future waiting for them to arrive; nor do they lie in the past as an inheritance acting from the past through the present Unrealized possibilities have no temporal priority, but when we

say that we consider the possibilities of seeds and children we have in mind plants and men These are nontemporal conditions coexisting in comparison There is thus a coactuality of comparison or the recognition of *potentia* The possible in this sense is coactual without being latent or imminent What has been called *potestas* turns out to be something actual as the condition of being in action, in performance, in production, in growth, in extending The outcomes of processes of productive change come out of the processes There would be no need to use the term *potestas* if we were usually in the habit of regarding process as actual The actual in context refers to the composite and distributed, the analyzed and synthesized The term *potestas* refers to the actual dynamic and sequential character of existence Growing up and growing old do not take place in our past nor in the unlived tomorrows but in living through our bodies and environments

Potestas as actual function can be destroyed by the destruction of the behaving individual I throw the packet of seeds on my desk into the fire and ask myself what has happened Certainly the arrangement and composition that made up the seeds has gone up in smoke In destroying the arrangement, I have also killed the performance of the seeds as seeds Granting that some of the seeds were alive, their performance might have continued under appropriate conditions to the future performable Since some seeds do not germinate and since not all that germinate mature, I cannot say that I have destroyed what would necessarily have occurred if the seeds had been planted Nevertheless, in destroying the make-up of the seeds, I have also destroyed the living character *Potestas* as the actual present performance of an individual is a going on that goes on to the further development of the individual If those destroyed seeds were the last of their kind left on earth, the destruction of present performance is also the destruction of the possible or future performable A prospective eventuation can be killed in the present in context and performance Future growing and future organization can be made impossible with the killing of present organization and process Where the performable in the future is seen to depend upon the perseverance in being of present individuals, the latter's destruction is fatal to the performable in the fate of the present performance

Upon empirical grounds, then, when I specify the actual I do

so as context and *potestas* or performance The actual is, on one account, the contemporaneous, distributive, structural, and composite It is the order and organization of an event or process On the other account, function, process, sequential activity, and productive change are histories and goings on An individual in arrangement is always at some stage or other in the history which it is making Beginnings and ends are equally actual when we are at a beginning or at an end Capacity is in the actual in the sense that the actual as context is also process or behavior The behavior displays the arrangement or order, and the order or arrangement in an individual history is reordered and rearranged in behavior The behavior is not deducible from the facts of composition or structure taken at any given time, or taken at the culmination of a process as an elliptical account of the history Function is never observed to take place except within some organization No priority of structure over behavior, or of behavior over structure, is in evidence in a concrete situation An ontology of forms results if the structure is established as prior or superior to behavior, a vitalism of force or power is implied when the matter or composition is separated from the processes in which it is rearranged

A description in *potentia* separates one stage of a process from another but implies no priority of reality to the earlier or the later. To make such an implication is to run into ontological difficulties *Potestas* as previously used refers to the processes of productive change actually going on at every moment, histories being made, things coming into and going out of existence as individuals The presence of composition and structure enables us to expect, predict, and control in respect to the general conditions of individual behavior, but this does not extend to the prediction of specific individuals and specific careers These latter are fraught with contingency, subject to chance, liable to novelty and spontaneity The order of known connections does not remove contingency from the temporal successions characteristic of activity, even though such successions after performance are found to fall entirely within the known order Where we can specify the range of operation, as in classical mechanics, we can establish the connections in advance by saying *if* certain conditions *then* certain results

II

To speak of histories is to speak of beginning and ending, of means and ends A teleological description is both natural and moral or in terms of deliberate purpose In a world of lumber, tools, and benches, a carpenter can have the purpose of transforming a board into a bench What is possible as a performable is limited to what can be done with the wood, the tools, and in respect to the carpenter's skill Purpose is only had where there is an intelligence, itself a history and also a historian Where expectation is absent, success and failure have no meaning Expectations and purposes are, as far as we know, dependent upon our having as well as being a history The tree is its own history but it does not grasp other histories than its own It does not compare itself at any stage of its growth with prior proceedings We distinguish, therefore, between the expectations and projects, the exercise of deliberate effort toward some goal and the outcomes of process, as they become evident to an observer Without memory we should not be able to compare earlier and later behaviors We observe that a spider's web catches flies and thus serves to maintain the spider's existence, but this requires no forethought in the spider It is not by taking thought that cells develop and trees bear fruit If adaptation to environment is a kind of intelligence, trees show this intelligence, but this is not intelligence used *by* a tree to direct its development

A teleological view is in evidence when continuities and histories in nature are admitted as existential Existence in a mechanical account does not displace teleological description The measure called for by a mechanical account is applicable to arrangement but not to the performance or *potestas* of the future performables Where individuals exist in character and the full character is admitted, the physical account is both structural and functional We do not need a metaphysical priority to existence of either mechanistic or vitalistic principles The meaning of existence in character is revealed both in respect to present composition and in respect to activity going on A comparison *in potentia* between this child and that man is not a comparison of two levels of development unless the continuity of development is accepted To deny such continuities to the existential state of affairs as concretely actual thrusts them either into an ontological status or into the subjectivism of a knower.

Our knowledge of past histories is from present evidence. As long as the explorations and interpretations of evidence are open to historian, paleontologist, archaeologist, anthropologist, and geologist, the possibilities of the past for investigation are not exhausted After the earthquake in southern California it is impossible that the persons who perished in the quake should not have perished, impossible, because they did in fact perish The inevitability or necessity of the consequence is not altered by any examination of the antecedents no matter how careful An end already determined enables us to select numerous histories all leading continuously up to the terminating event It does not enable us to alter the terminating event Performed events are regarded as possible when we place ourselves at some point prior to their occurrence and reinvoke the alternatives that might have been selected These alternatives are no longer selectable in the past They are possible if possible at all only to present or future selecting If we could place ourselves in the body of some past saint or scamp, our career in his shoes would be exactly in his footsteps For that career to be altered, the past would have to be future, that is, it would have yet to be actualized out of all the possible careers In the play, "Berkeley Square" the hero finds himself transported backward through time into the history of an ancestor He has to marry the girl he doesn't love, and she has to bear him a certain number of children A fatalistic world is a past without a choice of futures The paradox in the situation presented in the play hinges on the fact that the lived-through past has the specious character of appearing as a future

The past is known in the cumulations and continuances in the present and is thus subject to further procedures The possibility excluded in irreversible time is the reperforming of what is already performed as an individual's life-history The existence of past notables is for us the sum total of the known evidence not excluding fresh evidence that may turn up If evidence is to turn up in the future it will have to be existing through the present to appear later Another battle might be fought at Waterloo, but the Waterloo of Napoleon is forever lost to that general. The mistakes of the past are made mistakes The continuity or surviving or persisting of things in existence is the evidence in the present for our knowledge and inferences in respect to the past Whatever genuine pos-

sibilities the past has are existent in the present if they are to be discoverable or eventuable in the future

Historical inquiry suggests other eventuations than those which occurred A study of the conditions which are judged to have led up to the World War suggests that an alteration of the conditions might have averted the conflict A world court may possibly avert future catastrophes of this kind, it cannot possibly function to prevent the tragedies of the past Where we are concerned with histories, an instructive insight afforded by the past from present evidence has an effective moral only for the future which the present may realize Genuine possibilities in society are all those open for investigation and action from now on Any change in the sorry scheme of things is not a change entire but a change within some scheme or other Past failures in preventing wars or in discovering a general cure for cancer are indicative of difficulties but not impossibilities We entertain the hope of solutions as long as some course of inquiry is open Many problems are thrust aside not because they are logically or existentially impossible, but simply because no workable hypothesis is available The survival of a psyche after death is not impossible but it is not homogeneous with established fields of investigation Nonhomogeneity is only a practically certain criterion since new evidence may always turn up and lead to a recasting of current views That which is logically or physically contradictory is excluded once and for all from the respective fields under the conditions in which the contradiction has been established

III

In the account of the possible in connection with contexts and histories, I have attempted to steer clear of the Scylla of transcendent ontological forms, on the one hand, and the Charybdis of imminent teleology, on the other A thin empiricism of the Berkeleyan type requires an agency of an ontological mind. The phenomenalism of Kant calls for a transcendence of subjective aesthetic forms. Where existence is reduced to the discrete and static entities of perception, existence is exhausted of possibilities in its bare immediacy of presentation; it cannot be viewed as the actual extending to the possible without assistance from substance, force, forms, or some other *deus ex machina.* The descriptive empirical and

naturalistic account of the possible in the preceding pages is a "thickened" empiricism The status of the position can be further clarified by a discussion of its relation to the possible in a logical and a metaphysical setting

There is an important connection, I believe, between the doctrine of logical possibility presented by Dr Church and the preceding account of empirical possibility In the problematic judgment "A may be B" both A and B are terms in discourse and must be unambiguously defined to exclude each other Our discourse with definitions of things does not supplant or deny the activity of things about which we discourse By definition, a thing must be itself and not some other, but if each entity in its thingness is utterly unique no future similar thing can occur We say, "This child may be a man " Both child and men are actual but if the condition of being a man is not repeatable, to what does my judgment refer when I say *this* child may be a man? *This* child cannot *be* the men that exist but he may be like or similar to the men that exist It is this likeness or similarity that passes under the name of essence It is not manhoodness as a kind of separable reality The essence of what it is to be a man is just what men are and only exists where one or more men are found All existent men, however, do not exhaust what existent children may be when some future judgment is made The child is a child and the man is a man but they are connected by an external relation or relation *between* the two terms

For an empirical account this logical separation is seen as a specification of two stages within a continuous process The external relation is as logically necessary to the constitutive validity of the problematic judgment as the continuity of productive change is to empirical description The internal relation telescopes A and B together in an indissoluble unity or denies that they have anything to do with each other The possible gets swallowed up in the absolute and the problematic judgment loses all constitutive reference Dr Church's insistence upon external relations is duplicated on empirical grounds by an insistence upon the sequential and continuous nature of process

There is, however, in the continuity of development, a performing that cannot be taken up into logical analysis The separation of a process into discrete parts is essential for any measure or definition of the process When I am asked what I mean by the life-

history of a tree, I answer by referring to the series of stages beginning with the seed and ending with the tree No matter how frequent the pointings or discretions, I never succeed in any immediate cut in getting anything more than a discrete entity In cutting the process I get arrangement and composition A mathematical definition of continuity results when the series is considered to be compact, that is, where it is possible to insert any intermediate cut between any two cuts The synthesis of the discretes is a logical expression of the process, but the tree does not grow by mathematical synthesis To fix the actual in an infinitesimal of time is to exclude process just as completely as to insist that nothing is real except in the final and complete category of connectedness No analytical point nor synoptic finality admits of productive change When we cut a life-history into discrete entities, no synthesis will replace, even though it measures the process A serial order is required to make process logically intelligible, and the measure instituted by the series is the logical meaning of the process The flying arrow does not fly by geometrical analysis and synthesis, but some form of analysis is required if we are to define and measure the flight To hold a process for analysis is to fixate it The fixations are not the processes of agents operating, instruments being applied, purposes being acted upon, possibilities getting actualized A logical account of the possible is not concerned with what cannot be put into logical form

If what is perceived is called in scholastic terminology the "sensible species" or "form," our knowledge of the life-history as abstracted or intuited from the sensible by intellect is the intelligible form For the moderate realist, the intelligible form as common likeness in existence is separable only in intellect, where it has the status of essence The intelligible species as logical essence need imply no ontological status The doctrine permits no transcendence of character, to existence in character, no forms are considered existential apart from the individual that exists in form. Process is revealed by the sequences of sensible forms and understood through the intelligible form. The separability of form from corruptible matter is admirably suited to the theory of knowledge and the requirements of a classificatory logic Behavior and function, however, are thrust into an inferior status as merely material changes Corruption is in corruptible matter the process of which is subservient to

inalterable species Irregularity and contingency are not virtues of logic Nevertheless, the logical classification of existence into the syllogism where intelligible form is the major, the existent the minor, and its inclusion in the intelligible form the conclusion, does not banish the irregularities and spontaneities of the existent in a process of productive change

If the world were the speech of God, and the human intellect were competent to learn the language in its original syntax and conjugations, we might believe that grammar is metaphysics, that modes of signifying are modes of being We should be constrained to believe that Greek or Latin or English is equivalent to the language of Adam The Word of God that built the world would be the creative discourse The task of the human intellect would be to establish in our language the logic of that divine discourse We could say with Spinoza, "Whatsoever is, is in God and without God nothing can be, or be conceived " But just as the infinite intellect of God constituting the intelligibility of nature is not a substitute for the modes and their connections, so no system of logic is a substitute for behaviors, processes, comings into existence and goings out of existence To seize upon what is stable and to fix it in language is to have a science of the existing, but things under the aspect of eternity are still things the existence of which is indefinite and contingent Every man is a vertebrate and whatever is characteristic of vertebrates is characteristic of man as a vertebrate The system of morphological description is not the life of any vertebrate The distributive definition is not the dynamic and sequential process in the life of an actual man

An empirical account of the genuinely possible is not opposed to the doctrine of logical essences but denies that essence is ontological as well as logical A logic turned into a metaphysics banishes process and the indeterminate That banishment denies meaning to the genuinely possible in nature This is illustrated in the deterministic doctrine of Spinoza Every actually existent thing involves a double causality in Spinoza's system. First, it involves God, or eternal and infinite essence; for a thing is its essence, and all essences follow from God who necessarily exists Second, since essence or real definition does not determine the time and place of existence, every thing is determined to existence or nonexistence by other actually existing things. Thus, where neither existence nor

nonexistence implies contradiction (or, in our ignorance of contradiction), essences are called possible so far as we know something of their causes but are uncertain in respect to the time and place of determined existence Since logical essence of a thing never determines whether a thing has existed, now exists, or whether or not it may exist in the future, all essences are contingent in respect to existence considered upon purely logical grounds. They are possible so far as we know the causes but remain ignorant of whether these causes here and now determine to existence or nonexistence A modal judgment expresses a subjective suspense or expectation which is attributed to a defect of our knowledge and not to things It involves what is in essence but what may or may not be in existence Given determinate causes, the thing must exist; lacking these causes, its existence is impossible Everything existent here-now is determined to existence and is neither possible nor contingent The disparity between existence and essence is a reflection of the inadequacy and limitation of partial knowledge.

The doctrine of necessity in Spinoza is linked with metaphysical, logical, and physical frameworks or structures, and the implication of these fixed orders is timelessness or the eternal These structures do not tell us *why* events occur. Spinoza insisting that our purposes afford no explanation of why the universe should be constituted as it is The modes cannot exist except in terms of their constitution and the constitution of the environment Where this constitution is lodged in eternal actuality, no actualization can take place

The process of passing from human bondage to human freedom in the rational life makes freedom genuinely possible to man. An intelligible universe is implied, but not a universe that takes thought for Spinoza or any other intellect Spinoza's preference for and selection of what he conceives to be man's highest career is set within a universe devoid of preferences No preference is exercisable apart from the order of nature Action cannot escape limiting conditions and the limiting conditions are the unalterable structures of extension and thought. God does not prefer structure since He is the structure of the universe, but Spinoza, discerning both structure and behavior, thrusts time into the imagination in order to have a universe guaranteed against the vicissitudes of process. If man is a part of nature, nature in that part strives to escape from bondage under the aspect of process or time, to free-

dom under the aspect of eternity Search for the rational determination of one's life is a striving to realize one's possibilities For Spinoza the structure of the universe is indifferent to the events which exhibit it but man is not indifferent Man exercises preferences in the natural order even though that order may be innocent of preference The genuinely possible is therefore reserved for man alone It is excluded from the physical determinate machine, the timeless essences the eternal and complete Substance No weed of novelty is permitted in the *formal* gardens of nature The perennials there need no seasons to sustain their perpetual perfection The hybrid conception of the possible, to borrow Professor Loewenberg's phrase, cannot exist in such a Garden of Eden The snake must enter, a pragmatic snake with a venom for the absolute and completed.

Presumably all possibilities are open to a creator who is to actualize any universe to begin with, but the world we begin with is an actualized world with tendencies, regularities, conjunctions, disjunctions, limitations In such a world as we at present deal with, even an omnipotent Being, if He is to operate within the created, could only further actualize His reality by alteration within what already is The limitation of the possible in the actual is a loss of freedom and choice only to a being who is himself all actuality and whose possible worlds are limitations of that actuality To deal with completely free possibilities is not a possibility within actual contexts If it were, no reason would lead us to advance in this rather than that direction Only if some actual consideration of limitations is present, and some weighing of end results can be carried on, can we speak of probabilities and possibilities

The development of a child illustrates limitations at every stage of development Out of all possible careers and specializations only some careers and specializations are actuable The limitations within which process goes on yield control, selection, and emphasis Specialization furthers possibilities along the lines of specialization but the price is the neglect of the alternatives that might have been chosen An omniscient agent might conceivably follow all paths and arrive at all ends Where development is going on in many fields, we find that regularity and repetition enable us to measure, control, and expect, but not to escape from the process in which this takes place In a world where everything was possible

and nothing actual we could not actually begin to do anything We seek for possible starting points of investigation, but only from some actual condition do we begin A seed that could become any kind of plant would only realize its potentiality by becoming some kind of plant

The term "accident" for a deterministic metaphysics is expressive of human ignorance Yet all reasoning after the event does not exclude the hypothesis that in irreversible time the future may show forth what is not expected in the present and what the past has never displayed The stronghold of determinism is in the notion of eternal, inalterable structure and the retrospective view of the determined Confronted with productive change, the evolved, the produced, the made (even though completely known), are not exhaustive nor regulative of all that may be yet forthcoming Even in a completely deterministic system, we can still select, and regard this selection as a process which the system is not carrying on even though all selection is within the order and limitations of the system Where the natural structures are regarded as legislative of events, the forms or ideas in the mind of God are also angels and demons Man can then only hope that his soul is an angelic power, one of the active forms When the structures of process are first hypostatized and then energized in order to get process back into a world of natural events, one may admire the dialectic but question whether an actual state of affairs requires any such explanation

IV

If unrealized possibilities are the freight of every actual context, we need only view the actual under the aspect of a metaphysically embracing reality, to see the actual turned into an illustration of a possibility A metaphysical system turns existence into illustrations thus existence as revealing the glory of God, things as concatenations of atoms, the world as objects for subject, the phenomenal as objectification of the will, the extended as energized by the dynamism of monads, the copy as derived from the archetype, human truth as illuminated by God's truth. These conceivable interpretations and distinctions when hypostatized assume a priority, logical or temporal or both, to the connections and events which they were intended to explain Structure and behavior are mes-

capable in the existence of any individual, but if either be selected as reality, it turns the other into its illustration or explains it out of reality into appearance or defect, or privation The fact of metaphysics, whether or not there be any metaphysical facts, is an illustration that our actual world is fertile in its implications of possible systems and perspectives A metaphysics in affirming some possible interpretation of subject-matter does so from clues found in a world of stresses, perceptions, feelings, and thinking

The distinctions in experience and in thinking with which we begin as something actually had, made, or discovered, do not dangle as possibilities pending a decision upon the nature of reality Contents and contexts actually experienced and dealt with do not require a prior reality to be actual When it is said that "Good and evil would have no meaning if God did not exist," or "What would be the use of living uprightly if there is no after-life?" the fact remains that good and evil and upright living are made distinctions This does not remove the possible metaphysical implications, but such distinctions do not seem to depend for their value upon the metaphysically possible We might say with Lucretius that this composite world would not exist if atoms had not swerved together in the void, but the existing world does not depend upon the truth or falsity of such a statement Metaphysical implications imply an intelligence which can draw implications, but this does not make mind constitutive or constructive Objects do not have to be mentalized to be used or known Everyone in discourse makes the distinction between the saying and the thing said when he remarks, "I am talking about that" This actually made distinction may lead to some metaphysical construction or other but does not depend for its making upon any construction we may select Even if we were all angels soaring through the spiritual realm on incorporeal wings, we should, if we could discourse about our wings, maintain the same distinction

It is instructive to see how Descartes proceeds from the possibility of dualism to the assertion that the universe must be dualistic Descartes first maintains that he distinctly conceives mind as incorporeal substance and body or extension as corporeal substance Conceivability thus far yields two definitions and in essence they do not determine anything to exist But what I can conceive, God also can conceive, so we may assume that God "can carry into

effect all that of which we have a distinct idea "[1] Our conception of two separate essences is now a conception in God's mind God is also essence but his essence necessarily implies his existence by the ontological proof From the fact that we have an idea of corporeal substance, "although we do not yet know certainly whether such really exists at all, we may conclude that it may exist" How does this *may* exist get translated into *does* exist? The possibility of dualism has been transferred from the human to the divine mind Body which may exist entirely independent of mind does really so exist because, as Descartes states, "however closely God connected them He could not set aside the power He possessed of separating them one apart from the other, and those things which God can separate, or conceive in separation, are really distinct "[2]

The classical model for turning the conceivable into the real is found in Genesis, where we are told that God *said* let there be light and there *was* light As long as no one questions the Logos or a transcendent and supreme being as a metaphysical principle, a possibility is held by faith as reality The deification of splendid possibilities has given metaphysical systems a powerful aesthetic appeal As long as one asserts only conceivability, he need beware only of self-contradiction When, however, the metaphysician appeals to conceivable reality in order to turn the logically noncontradictory into ontological dualism the trick requires a magician who makes living rabbits out of words We wish to believe in certain essences as more than possible in themselves, and to see our actual world guaranteed by a higher actuality We pay a curious price, philosophically speaking, when the possibility that we call reality is so complete and eternal that no place is left for genuine possibilities except in human ignorance, the ignorance that lacks full illumination by or adequation to the eternal principle That which just is and that which absolutely is, are alike devoid of the restlessness and instability of things within the orders of their processes Security, stability, and regularity are sought for and the conditions of their discovery are in things and thought. We outrun in our desire for perfection the amount of order that is so far evident, when we conclude that our search is a merely temporal movement within the absolute A doctrine of perfect and eternal being

[1] *Principles of Philosophy*, First Part, Principle LX.
[2] *Op cit*, First Part, Principle LX

requires us to introduce the devil into a system, for we are deviled by contingency and accident, and we do prize individuality, variety, and action

Yet if we begin as Schopenhauer does with the blind, world-making will, its first objectification is the Platonic forms as eternal structures through which the will sprays into discreteness. A change of faith in final objects, an alteration of cosmic belief may influence our attitude and shift the course of our efforts at explanation, but our desire and our effort are always manifested in our contextually actual world and not in some cosmic otherness A project or plan is practically possible to the degree that instrumentalities for its effectuation are at hand or being developed Possible realities are not the efficacies of the genuinely possible Faith may transform a possibility into a maxim for action Mountains are moved under actual conditions of which faith is one, but this does not make the object of faith actual except as effects and procedures can be said to be the meaning of our concept

A concern for genuine possibilities implies metaphysical hypotheses if we push from the distinctions of manyness of context, indeterminacy of futures, and performance of individuals in character, into pluralism, indeterminism, and empirical naturalism The conducting of inquiry and the making of distinctions are still specific and actual wherever they are found to be going on, even though we may now choose to see them within a more generalized setting The generalized conditions within which genuine possibilities are said to be actualized are not the possibilities, nor a substitute for context and performance Our comparisons are of actual context in which *potentia* is revealed; and our hope is in the activity, productive change, operation, or performance which I have called *potestas* Eventualities are expected from events, the performable from what is in performance The possible has its roots in the actual From performed and performance we expect the genuinely possible, but it is only after what can be is actualized that we know what must have been possible

THE LIMITS OF POSSIBILITY

BY

D. S. MACKAY

THE LIMITS OF POSSIBILITY

D. S MACKAY

I

THE PREVIOUS LECTURES have dwelt on the distinction between the possible and the actual. But the possible is also contrasted with the impossible, and it is from this angle that I wish to approach the problem What, if anything, lies beyond possibility? On the near side is the actual What is on the far side? What are the limits that separate the possible from the impossible? Perhaps I shall be accused of launching upon a discussion of nothing at all An impossibility, I may be told, is utterly unreal because inconceivable For reasons that I hope to make clear in the course of the discussion, I am unable to accept this assumption. What is impossible is not, as I suppose, equivalent to the inconceivable If the structure and tendencies of actual events determine the range of possibilities, then by the same token they mark the boundaries of impossibility, whose status and character are no less dependent upon actual conditions Indeed, all practical wisdom or intelligence consists in directing our conduct within the discovered limits of possibility—in learning *not* to pursue the impossible If anyone should seriously contend that he had never encountered an impossibility, he would seem to me to be either insane or endowed with powers more than human

I wish to maintain the position that the limits of possibility lie within the actual structure of existence, that the concatenation of things or events here and now determines what is possible and impossible at any time or place It has often been held, on the contrary, that the domain of possibility is wider than the domain of actual existence and that consequently the limits of the actual fall within the scope of the possible. There are two principal versions of this view, one of which identifies possibility with what is rationally *conceivable,* while the other identifies it with what is empiri-

cally *sensible*. Each version derives a certain plausibility from ambiguities in the notion of possibility We must therefore examine the diversity of meaning in this "hybrid" notion

II

It is difficult to regard possibility either as a relation between things, as a property inherent in them, or as an attribute predicable of them Between an actual and a possible state of affairs there is intrinsic similarity So far as either subject or predicate is concerned, there is no difference between the proposition that a man *is* walking and the proposition that the same man *may be* walking A universal proposition remains universal and a particular proposition remains particular whether the assertion of them be problematic or categorical Nevertheless, the ascription of necessity, possibility, or impossibility to propositions seems to alter their formal relations of opposition and sequence Thus, the contradictory of the proposition, "It is possible that all planets are inhabited," is not the particular negative, "It is possible that some planets are not inhabited," but the proposition, "It is impossible that any planets are inhabited " The latter statement implies the necessity that all planets should be uninhabited But if it were true that all planets are necessarily uninhabited, then it must also be possible that some may not be inhabited This proposition, however, does not contradict but implies the proposition that some planets may be inhabited We have therefore reached the absurd result that if it is impossible that any planets are inhabited, it is also possible that some may be inhabited Now consider a proposition about an actual state of affairs From the fact that you are sitting in this room at the present moment I can infer the possibility of your being in these seats half an hour from now It is also possible that you may not be here That will depend upon the length of this lecture and the extent of your patience, not to mention more remote contingencies However, your actual presence clearly implies your possible presence in this room But since it is true that you are actually sitting here at the present moment, it is impossible that you should not be sitting here, and the alternative proposition, "it is possible you may not be sitting here (say) half an hour from now," is false So far as I am able to infer from the formal relations of the propo-

sitions alone, you may be doomed to sit here through eternity listening to an interminable lecture on possibility [1]

The logical paradox in these arguments is caused, of course, by ambiguities in the use of the words "possible," "impossible," and "necessary" The meaning has shifted from the truth-value or *extensional* significance of the propositions to their logical content or *intensional* significance There is nothing in the formal opposition and sequence of the several modes themselves to indicate whether merely logical possibilities or possible truth-values are intended Because of this ambiguity, many logicians have concluded that the whole question of modality is extralogical and that the formal distinctions between possibility, impossibility, and necessity are "epistemic," not "constitutive" On this view, the modal function of a proposition merely indicates our comparative knowledge or ignorance of the reasons for believing it to be true or false But the paradox is not resolved by transference from the sphere of logical analysis of propositions to the calculus of probabilities The same modal distinctions between the propositions will apply, whatever the degrees of certainty with which we entertain them Regardless of the amount of evidence at our disposal, we can and must differentiate modally between such propositions as "It is raining today" and "It may possibly rain today," or "It is necessary that every finite number should have a successor" and "It is impossible that two straight lines should enclose a space." These modal distinctions express differences in *what* we believe to be the case, not merely different degrees of certainty with which we believe it. If it were otherwise, we should have to conclude that the same state of affairs is made actual or possible merely by the way in which we conceive it

There are at least two major ambiguities concealed in the notion of possibility One of them arises from the different relations that subsist in systems of strict and material implication The word "possibility" may mean either self-consistency in the logical content of a proposition, or else the truth of elementary propositions in the extension of a class. The second ambiguity arises from the fact that statements contain terms the meaning of which is variable while the range of their significance is fixed Thus, the statement

[1] Compare Aristotle, *De Interpretatione*, 22 b

that all men are mortal means the *general* possibility of their death, and it means specifically that every human being does actually die at some time or other But the *specific* death of each individual also remains only a possibility for those who are still alive or as yet unborn These ambiguities are implicit in traditional systems of logic, but they are concealed by the terms of ordinary language In mathematical or symbolic logic, however, while the ambiguities are not removed, they are given a systematic and explicit statement

1 Consider, first, the ambiguous meaning of "possibility" as signifying either absence of contradiction, on the one hand, or what is possibly true, on the other The distinction rests on the differences between the strict and the material implication of propositions The statement "p *materially* implies q" means "It is not the case that p is true and q false" The statement "p *strictly* implies q" means "q is deducible from p" Now, the latter is a *narrower* relation than the former, in the sense that "whenever a strict implication can be asserted the corresponding material implication can also be asserted," but the converse does not hold While material implication is the wider relation, nevertheless "the assertion of a strict implication is a *stronger* statement than the assertion of the corresponding material implication "[2] This means that the *limits* of possibility are less restricted but also less rigorously defined in a system of material implication than they are in a system of strict implication In other words, "impossibility" and "necessity" have a *narrower* meaning in terms of strict implication, while "possibility" has a *wider* meaning than it has in terms of material implication If we take the modal function "p is possible" to mean "p is self-consistent" or "p does not imply its own negation," then the denial of this function will read "It is false that p is possible" or "p is impossible" The modal function "not-p is possible" means "It is possible that p be false" or "p is not necessarily true" The denial of this function will then read "It is impossible that p be false" or "p is necessarily true," which means "The denial of p is not self-consistent" or "The truth of p can be deduced from its own denial "[3] In a system of material implication, however, the

[2] Lewis and Langford, *Symbolic Logic*, p 137.

[3] *Ibid*, pp 159–160

statements "p is possible" and "p is necessary" are both indistinguishable from the statement "p is true" And the statements "p is impossible" and "p is possibly false" are both indistinguishable from the statement "p is false" Here, "possibility" is taken in a comparatively *narrow* sense, as meaning whatever may be true with respect to specific cases "Impossibility" is taken in a comparatively *wide* sense, as meaning whatever may be false with respect to specific cases We must therefore distinguish between *absolute* and *relative* possibilities For we may speak of absolute or unqualified possibilities (and impossibilities) in the sense of absence (or presence) of internal contradiction Every self-consistent proposition expresses a possibility which, in this sense, is not relative to any actual state of affairs or even to our knowledge as a whole It is an *absolute* possibility that all planets should be inhabited, since the conception of an inhabited planet contains no contradiction But it is a *relative* impossibility that certain planets should be inhabited, owing to their distance from the sun, their lack of atmosphere, and other conditions of life as we conceive it In this sense, the meaning of "possible," "impossible," and "necessary" refers to the relations which a proposition has to actual data or facts open to experimental investigation

What, then, are the logical relations between these absolute and relative modes? (*a*) *Relative possibility implies absolute possibility, but the relation is not reversible* From the actual existence of life on this earth I can infer the absolute possibility that planets should be inhabited But I cannot infer from this that life is relatively possible on any particular planet (*b*) *Absolute impossibility, that is, self-contradiction, implies relative impossibility, but the relation is not reversible* Knowing that a red patch without color is an absolute impossibility, I can assert that no such things exist But I cannot infer that a purple cow is an absolute impossibility simply because I have never seen or hoped to see one. (*c*) *Absolute necessity implies relative necessity, but relative necessity does not imply absolute necessity*[4] As I tried to show in my discussion of causality,[5] failure to recognize that this relation is not reversible is largely responsible for the fallacies of logical determinism Causal laws are generalizations from practical and rela-

[4] *Ibid*, pp 161, 271 [5] *Univ Calif. Publ. Philos*, XV, 131 ff.

tive necessities encountered in observed sequences of events It is *in order to produce* a certain effect that a given or sought cause is practically necessary [6] But we cannot infer the absolute logical necessity of causal laws from the relatively necessary sequence of particular events Logical determinism is a systematic confusion of strict with material implication.

2 Let us consider now the second ambiguity in the notion of possibility arising from the variable meaning of a term whose range of significance is constant Symbolic logic simply gives this ambiguity a systematic form in the idea of the propositional function and its variables Essentially the function is itself taken to be an ambiguity, since it ambiguously denotes its various values, and not any definite one of them By substituting determinate values for the variables we get unambiguous statements which make the function true or false [7] To revert to our previous illustration, the statement "x is inhabited" is a propositional function, the ambiguity of which consists in the fact that if we substitute for "x" "the Earth," the statement becomes true, if we substitute "Mercury," it becomes false, and if we substitute "$\sqrt{-1}$," it becomes absurd The statement "It is impossible that Mercury should be inhabited" means that within a certain range of significance "x" is given the specific meaning "Mercury," which makes the function "x is inhabited" false For when we speak of "being inhabited" we mean planets or other bodies capable of sustaining life as we conceive it The statement "It is impossible that the $\sqrt{-1}$ be inhabited" employs the word "impossible" in quite another sense It means that the specific term "$\sqrt{-1}$" is excluded from the range of significance proper to the function "x is inhabited" The meaning of the term is not thereby consigned to oblivion, but merely referred, by implication, to some other context or range of significance There are thus two kinds of possibility and impossibility expressed by a propositional function and its variable those constituted by the range of the function itself and those constituted by a disjunction of values within that range of significance The difference is apparent in comparing the two statements "ϕx is true for all values of x" and

[6] That is, causal necessity is neither the *logical* necessity in the relation of grounds and consequences, nor the *mechanical* necessity of "invariable succession" it is a *teleological* necessity in the relation of structure to function

[7] Russell and Whitehead, *Principia Mathematica* (ed 2) I 39, 47

"ϕx is true for some value or values of x" If "l, m, n" do not lie within the range of values that make sense when substituted for "x," then such expressions as "ϕl, ϕm, ϕn" are impossible, that is, absurd But if "a, b, c, etc" represent different values of "x," and "ϕx" is sometimes true, then either "ϕa" is true or "ϕb" is true or "ϕc" is true, and so on It might then be that, "ϕa" being true, "ϕb" should be impossible, that is, false, although not absurd

Let us designate these two kinds of possibility (and impossibility) *functional* and *variant* By "functional possibility" I shall mean inclusion within the range of values that make sense when substituted for the variable Its limits are the invariant part of the propositional function, so that "functional impossibility" will mean exclusion of a value from its whole range of significance By "variant possibility" I shall mean the alternative truth or falsity of propositions which result from the substitution of values for the variable within the function's range of significance Its limits are expressed by the theorem that no proposition "p" is both true and false Now it should be noted that a functional possibility (or impossibility) may be construed in either an absolute or a relative sense In the former sense, inclusion within the range of significance means consistency, and exclusion means inconsistency, with respect to *logical content* In the latter sense, the inclusion and exclusion mean relevance or irrelevance to *context* But its limitation (that is, "functional impossibility") with respect to *context* implies its limitation with respect to *content* And these relations are not reversible Variant possibilities and impossibilities are to be understood, however, *only* in the relative sense They refer to what is specifically the case or not the case in an actual context, irrespective of the intension or logical content of their propositions It must be admitted, therefore, that no symbolic statement of functional or of variant possibilities is theoretically adequate For it presupposes the ability to exhaust all determinate values of a variable within a given range of significance But in many contexts the number of distinct values is infinite. Furthermore, the limits of the possible values are not solely dependent on their relations to states of affairs within the given context An external reference to other contexts is often implied, in the sense that a functional impossibility in one context may refer to a variant possibility in another, while a variant impossibility in one context may refer to a func-

tional possibility in another More precisely, the statement of a functional impossibility in a given context may involve among its constituents some term or terms of propositions expressing variant possibilities in another context And a constituent of a proposition that may be either true or false in a given context may also be included within a range of values proper to another context

III

The result of this brief excursion into symbolic logic points to the conclusion that the limits of *all* possibilities lie in *the conditions of variant possibilities* Impossibility is "imbedded" in the relativity of contexts and perspectives through which events acquire significance Each context is a system of active tendencies which, as viewed through various perspectives, are significant of "absolute" and "relative" possibilities Within the context, there are conflicting tendencies whose mutual opposition engenders *relative* impossibilities But tendencies in one context also constitute limitations and determine impossibilities of concurrent tendencies in other contexts *Absolute* impossibility means otherness of context This hypothesis implies that for every possibility there must be some actual state of affairs, which is logically prior to it How, then, are we to answer the assertion that the domain of the possible is wider than the domain of the actual? For we are able to conceive objects that do not actually exist, we are able to imagine more than we actually observe But nothing exists (we are told) which is neither conceivable nor imaginable nor sensible Since conceived or imagined things are often impossible in fact, it is argued that the limits of the actual are narrower than the limits of the possible. Hence, possibility does not logically presuppose actuality This view has been ably defended by Dr Church [8] If I understand him correctly, possibility was conceived to be the *repeatability* of logical characters in particular existences He argued that the actual recurrence of the same character implied its prior identity as an essence in distinction to its particular occurrences. We seem to be committed to the view that any actual existence owes its nature to the repeatability of identical characters from a subsistent realm of pure essences It is not clear to me, however, why every occurrence

[8] Present volume, pp. 29–31.

of an essence implies repeatability, that is, possible recurrence, unless we confer upon essences some status *in posse* that is independent of their status *in actu* Such an assumption would make no provision for the emergent or the *sui generis,* and these are at least intelligible alternatives to the recurrence of identical characters Thus, if qualities are unique and ineffable, as G E Moore and also C. I. Lewis seem to suppose, it would be meaningless to speak of them as repeatable identities In spite of that, we could still refer to a quality as possible, for example, the color of the volume in which this series of lectures may possibly be published

We must therefore examine more closely the claim that the limits of actual existence lie within the wider domain of possible existence The meaning of "possibility" is, as we have seen, doubly ambiguous It may be defined in an "absolute" or a "relative" sense, and in a "functional" or a "variant" sense This is not a matter of mere complexity in the notion of possibility, such that it might be analyzed into its simple components It is rather a question of an *essential ambiguity,* which is systematically expressed in theorems of symbolic logic In the light of such diversity of meaning, it is obvious that the logical priority of essences to actual existence cannot be affirmed without serious qualification We can agree that any proposition about an actual state of affairs implies a proposition about its possibility The absolute possibility that such and such a state of affairs should occur can be inferred from the relative possibility of its occurrence This simply means that assertions can be made about it which are not contradictory For, as James remarked, "we are masters of our meanings" Any actual state of affairs must be a conceivable state of affairs But surely we are not entitled to conclude from this that actual existence is a mere determination of antecedent possibilities, and that whatever is impossible in fact presupposes its inconceivability in thought To maintain, as Leibniz did, that all the future states and activities of an individual are contained in and limited by the essential notion of that individual, is to argue fallaciously from absolute to relative possibility and from relative to absolute impossibility.

A specious plausibility is given to such arguments by the quite arbitrary assumption that possibilities are *predicated* of things as attributes of their subjects If all that ever happened to Julius Caesar was implicit in his individual essence, as Leibniz main-

tained, then Caesar's actual career might be regarded as merely the contingent determination of anterior possibilities It was impossible for him not to have crossed the Rubicon, assuming that this event is truly *predicated* of the real Julius Caesar Have we any good reason to consider possibility as an attribute of a subject? Kant exposed the fallacies that result from the use of the word "existence" as a qualifying adjective His familiar criticism of the ontological argument applies with equal force here The contention that actual events are reducible to the essential possibilities in the notion of an individual substance is based on the assumption that the words "possible" and "actual" are qualifying adjectives In denying this assumption, we need not suppose that there are events in the abstract, *qua* events, without any characters All events are qualified events But we can and should distinguish between the *character* which an event possesses and the mode of its *occurrence* "Possibility" and "actuality," "impossibility" and "necessity," refer primarily to the latter Their "being" is *adverbial,* not adjectival Let us say, then, that *actual existence permits but does not possess possibilities* No analysis of a given fact, however minute and exhaustive it might be, would discover a possibility among its *constituents* The possibility of exploding is not a part or an attribute of a stick of dynamite It does not *belong* to it in the sense that its size, shape, weight, or chemical elements are said to belong to it The chemical nature of the dynamite *permits* the possibility of explosion under certain conditions

To identify the possible with the conceivable is simply to center the whole problem in one species of possibility among others We have still to inquire what constitutes the possibility or the impossibility of conceiving something to be the case It is not enough to reply that the absence or presence of a contradiction is a determining factor The Law of Contradiction expresses a necessary condition for intelligible thought and discourse But conceptions must not only be free from contradiction, they must also be *significant* The Law of Contradiction is not an originative source of significance As we have seen, things may be said to be impossible either in an absolute or in a relative sense There is a corresponding distinction in the use of the word "inconceivability" An "absolute" inconceivability is that which contains a direct contradiction in terms A "relative" inconceivability is that which we are unable to

conceive as realized in fact In the former sense, to be inconceivable is to be impossible Thus, it is absolutely inconceivable, hence impossible, that two straight lines should inclose a space Since absolute impossibility implies relative impossibility, we can infer that there are no instances of a space inclosed by two straight lines Does it follow that what is *relatively* inconceivable is also *relatively* impossible? By no means Indeed, there are numerous illustrations from the history of science showing that what is relatively inconceivable, that is, incredible, in one age, may become a commonplace in a later age Few would wish to assert that mere changes in human beliefs are sufficient to transform what is impossible at one time into what is possible at another People were once unable to conceive of the Antipodes as existing, in the sense that bodies should remain unattached to the other side of the earth It was once inconceivable that heavy and light bodies should fall with equal velocities To say that it was not *really* inconceivable, even though men *thought* so, is a weak evasion It is only from our modern standpoint, within a different context and with additional evidence at our disposal, that we now find it not only possible but necessary to believe in the Antipodes or in the uniform acceleration of falling bodies That these affairs were once relatively inconceivable was owing in part to their inconsistency with established beliefs about the nature of bodies and the privileged position of the earth No one was able to conceive of such a state of affairs being realized, so long as all bodies were assumed to exist in an absolute above-and-below relation to the earth[9] Because it was once relatively inconceivable, need we suppose that it was also impossible that there should have been unattached bodies on the other side of the earth? On the contrary, we know that this state of affairs

[9] Some of the contradictions between concepts based on this notion and the concepts of modern science have been discussed recently in an article by George R Montgomery, "The Above-and-Below Notion" He says that "to one who saw the world as flat, the belief that there is an above-and-below to everything, and that up-and-down is an integral quality of all space represented one of the immediate facts of experience. It represented also one of the great ultimate and final truths His cosmology and even his theology were shaped to accord with this supposed ultimate fact. All those generalizations, however, as to stellar space and as to heavenly abodes which the ancients made, or which some still make today, basing the generalizations on the notion of above-and-below, were and are in contradiction with the larger range of facts as we have come to know them" *Jour Philos*, XXIX, 647–648

was not only possible but actual The difficulty arises from a confusion among the meanings of impossibility We have shifted our standpoint from relations of strict implication to those of material implication It was inconsistent with the assumptions of Ptolemaic astronomy, including the notion of an absolute above-and-below relation in space, to suppose that bodies could move freely on the undersurface of other bodies When we ask whether it is true or false that there were men actually living then on the other side of the earth, we are raising a different kind of question We are concerned with the truth-values or material implications of the propositions not merely their logical content and the absence of contradiction In relation to the wider range of facts as we have come to know them, it is true that what were called the Antipodes did exist then and do exist now But they remain no less inconceivable to men of a former age

Whoever wishes to maintain that the limits of possibility are coextensive with the limits of conceivability must resort to a priori arguments to support his thesis As Peirce remarked, these "received such a sockdolager from Stuart Mill in his Examination of Hamilton, that holding to them now seems to me to denote a high degree of imperviousness to reason"[10] At the same time, Mill's own passion for liberty carried him too far in the other direction In his fear lest any candidate for existence be unjustly suppressed, he admitted into the domain of possibilities even such notorious rebels against the Law of Contradiction as round squares and bodies at once all black and all white [11] Against his opponents he rightly maintained that "what is inconceivable cannot *therefore* be inferred to be false"[12] In other words, *relative inconceivability does not imply relative impossibility* But he wrongly denied that absolute inconceivability implies absolute impossibility, and there-

[10] C S Peirce, *Chance, Love and Logic*, p 191

[11] "These things are literally inconceivable to us, our minds and our experience being what they are Whether they would be inconceivable if our minds were the same but our experience different, is open to discussion ... We should probably be as well able to conceive a round square as a hard square, or a heavy square, if it were not that, in our uniform experience, at the instant when a thing begins to be round it ceases to be square, so that the beginning of the one impression is inseparably associated with the departure or cessation of the other"—J S Mill, *Examination of Sir Wm. Hamilton's Philosophy* (ed 6), pp 87–88

[12] *Ibid*, p 85 Italics mine

fore relative impossibility as well Curiously enough, this led Mill to adopt a theory of possibility analogous to the very view which he was attacking He virtually restates, in psychological terms, the assumption that the possible is logically prior to the actual According to the postulates of his empiricism, we have no means of ascertaining what lies beyond our possible sensations Thus, the possible means the sensible and the limits of possibility are predetermined in experience by "the law of Inseparable Association" among our ideas To assert that anything is absolutely impossible is merely to say that we are unable to form any conception of it But "our inability to form a conception always arises from our being compelled to form another contradictory to it "[13] How any conception could be said to contradict something that it is impossible to conceive, Mill does not attempt to explain It would seem to be more consistent with his general view to say that whatever *can* be conceived *is* conceived, that the sole evidence it is possible to produce that anything is conceivable is that people actually do conceive it When Mill proceeds to state the psychological reasons for our *belief* in an external world, he implies that the actual existence of material objects can be established on no other grounds The *ratio essendi* becomes equivalent to the *ratio cognoscendi* Now, the reasons offered for our belief in an external world are, "first, that the human mind is capable of Expectation," and "secondly, the laws of the Association of Ideas " The former accounts for "the conception of Possible sensations," the latter for the limits we assign to them in our conceptions [14] To think of anything as actually existing when it is not perceived is to think of "a group of possi-

[13] *Ibid*, p 88

[14] "When *two* phenomena have been very often experienced in conjunction, and have not, in any single instance, occurred separately either in experience or *in thought*, there is produced between them what has been called Inseparable . Association When an association has acquired this character of inseparability, . . not only does the idea called up by association become, in our consciousness, inseparable from the idea which suggested it, but *the facts or phenomena answering to those ideas* come at last to *seem* inseparable in existence: things which we are unable to conceive apart, appear incapable of existing apart "—*Ibid*, p 226 Italics mine If Mill had been consistent with the psychological atomism, which his empiricism presupposes, he could not have spoken here of *two* phenomena when there is no separation either in impression or in idea Every distinct perception *is* a distinct existence, and where there are no separable perceptions we have no right to assume there are distinct existences. As Hume insisted, "all ideas, which are different, are separable," and "to form the idea of an object, and to form an idea simply, is the same thing "

bilities of sensation " Apart from these, we have no ideas of material objects and it is simply the persistent *expectation* of certain related sensations that constitutes our belief in objective existence For these reasons, Mill defines matter itself (not merely our *conception* of a material object) as "a Permanent Possibility of Sensation "[15]

The crux of the whole argument lies in the assumption that the human mind is capable of *expectation* For all possibilities of sensation are supposed to depend on an attitude of expectancy What else can such an attitude be than a sense or perception of future possibilities added to the coexistence and succession of impressions that constitute present experience? Mere association of ideas will not account for this additional factor Expectancy implies the presence of *tendencies* in experience without which there could be no reference to what is absent or remote The notion of a tendency, however, implies the notion of possibility, which must therefore be, in some sense, independent of our expectations Thus, we are compelled to reverse Mill's doctrine Instead of saying that the material of the environment consists of possibilities of sensation, which depend in turn on our attitudes of expectancy, we must say that the possibilities of "sensation" depend on the actual materials of the environment, and that our attitudes of expectancy imply an objective reference to such possibilities

The experimental study of "intelligence" or purposive behavior, both animal and human, tends to confirm the latter view With the demand for a distant "goal-object," such as food or water, the whole situation in which an animal finds itself becomes what Tolman has described as a "means-end-field "[15] Thus, a rat learns to run a maze or a monkey learns to manipulate a pole as the most direct means of reaching a "demanded goal-object " The way in which the animal learns to respond to novel changes in the means-end-field makes it necessary to suppose that alternative possibilities *in the actual materials of the environment* become determining factors in the animal's behavior It is not only that a rat runs down this or that alley in the expectation of encountering the goal-object. His actions also exhibit, *seriatim,* an expectation of immediate

[15] *Ibid*, p 233

[16] E C Tolman, *Purposive Behavior in Animals and Men*

means-objects in the successive features of the maze—an expectation which furnishes

"a prior 'setting' of the behavior for such subsequent encounter as 'here an opening', 'there a wall', 'here a smell-able crevice', and the like . . The actual encounter which verifies or fails to verify that 'this is an opening, a wall, or a crevice,' is a temporally separate and later event It is an event which occurs after the stimuli and the immanent expectations which the stimuli release "[17]

Purposive behavior involves something more than reaction tendencies based on past performances and immediate stimuli to release them It requires *supporting* features in the environment and the continuous expectation that such supports are going to verify the behavior or make it possible [18] Even on the somewhat dubious assumption that rats possess "ideas" of what they are doing or have done in running mazes, their behavior in novel situations can scarcely be attributed to a mere association of these "ideas " The experiments seem to indicate that possibilities in the situation itself enter into and affect the animal's behavior in the shape of "immanent expectations " It reacts not only to specific details in the means-end-field but also to its pervasive or "formal" features, such as sequence and differentiation, distance and direction, multiplicity of paths leading to a single goal, reverse ends of one and the same route [19]

The discussion of expectancy and possibilities of "sensation" points to the distinction we have made between *functional* and *variant* possibility Tolman's account of "immanent expectation" is a description of functional possibility in terms of behavior. Rats and monkeys, and most human beings, indeed, are not symbolic logicians! But the meaning expressed in human discourse by a

[17] *Ibid*, p 84

[18] "A rat cannot 'run down an alley' without an actual floor to push his feet against, actual walls to steer between, actual free space ahead to catapult into And in a discrimination-box, he cannot 'choose' the white side from the black without actual whites and blacks continuously to support and verify such a choice Behavior-acts and their immanent expectations are released by stimuli, but they demand and are sustained by later coming *behavior-supports*. In parenthesis it may be remarked that this fact that supports, and not merely stimuli, are needed for the actual going-off of any act and are expected by such an act, is a feature about behavior which orthodox psychologies, both stimulus-response psychologies and mentalisms, seem hitherto to have overlooked "—*Ibid*, p 85

[19] *Ibid*, pp 164 ff "Inferential Sign-Gestalt-Expectations."

propositional function represents, on a higher level, these "immanent expectations" in animal behavior Logical and mathematical functions are highly abstract symbolic expressions for sets of possible operations and relations The significance of the specific terms with which these operations and relations are concerned is not constituted by the functions which express them Rather, their range of significance is determined by the possible truth-values of their variables These truth-values imply information conveyed by ideas that are *outside* the deductive or mathematical system to which the functions and their variables belong [20] In other words, *the limits of functional possibility are determined by the range of variant possibilities* The latter, in turn, are set by conditions that are *external* to the context or system of propositions in which the functional possibility is defined

If my analysis is correct, Mill's psychological theory of expectation and possibilities of sensation rests on an erroneous assumption in his logical theory He has simply reversed the relationship between functional and variant possibilities

> I see a piece of white paper on a table [says Mill] I go into another room If the phenomenon always followed me, or if, when it did not follow me, I believe it to disappear *é rerum naturâ*, I should not believe it to be an external object . But, though I have ceased to see it, I am persuaded that the paper is still there I no longer have the sensations which it gave me, but I believe that when I again place myself in the circumstances in which I had those sensations, that is, when I go again into the room, I shall again have them . My present sensations are generally of little importance, and are moreover fugitive the possibilities, on the contrary, are permanent, which is the character that mainly distinguishes our idea of Substance or Matter from our notion of sensation [21]

Suppose, however, that my persuasion that the paper is still there should be false Can we then still define the matter—*the particular*

[20] Compare B A Bernstein on "Whitehead and Russell's Theory of Deduction as a Mathematical Science" "The propositions of a mathematical science (a science in the sense of a pure deductive theory) concern a certain totality of things and certain connections among the things, they give information about a certain *class* of *elements* and about certain *operations* or *relations* among the elements The classes, operations and relations constitute the *ideas* of the science . Since the propositions of the science give information *about* its ideas, every proposition must contain, beside the ideas *belonging to* the science, also ideas that are *outside* the science. The latter are the ideas of general language by means of which the information is given"—*Bull Am Math Soc*, June, 1931, p 484

[21] *Op cit*, p 228

subject-matter—of my belief as "the permanent possibility of sensation"? If I believe that a sheet of my notes is on my desk today where I remember leaving it yesterday, what determines the truth or falsity of that belief is not just the permanent possibility of perceiving an object of a certain shape, size, color, etc It is rather the impermanent or variant possibility that such an object either is or is not in that particular place at this particular time This kind of possibility is neither contained within nor determined by the limits of the functional possibility

IV

We have now considered the several senses in which a possibility may be affirmed or denied Confusion of these meanings and their implications has led to the erroneous conclusion that all actual existence is a determination of prior possibilities, whether conceivable or sensible (*a*) Because relative possibility implies absolute possibility, it has been wrongly supposed that relative impossibility implies absolute impossibility Or, because absolute inconceivability implies absolute impossibility, it has been inferred that relative inconceivability implies relative impossibility. Hence, it is wrongly supposed that what is conceivable in thought fixes the limits for what is realizable in fact, and that the reverse does not hold (*b*) Again, because functional possibilities include variant possibilities within their range of significance, it has been wrongly assumed that the limits of the latter are fixed by the logical constituents of the former, whereas, the limits of functional possibility are determined by the range of variant possibilities. It is a truism that "every possible value of a variable is a constant."[22] But it is far from true that every constant is a possible value of a variable. The truth of the elementary propositions that satisfy a function is not established merely by prefixing the sign of an inverted — E. It depends upon actual conditions that are external to the ideas expressed in the function itself. When Hamlet cried, "To be or not to be," he was stating a variant possibility that implied other conditions of fulfillment than man's mortality in general. The limits of any possibility, whether absolute or relative, are based upon the conditions of variant possibilities These limiting conditions are

[22] Russell, *Principles of Mathematics*, p. 351.

actual states of affairs and by "actual." I mean active, on-going, substantial processes and not mere possibilities of thought or sensation Actual things or events permit and withhold possibilities I have suggested that in permitting them things do not *possess* possibilities It might be added, that in withholding them, they do not *annul* them What is beyond the limits of possibility is not thereby deprived of all being and reduced to a sheer nonentity It has at least a verbal status in some context of discourse, even though it be no more than an example of nonsense or absurdity

The main theme of this discussion has been that the meanings of things are the possibilities they permit, and that the limits of their meanings or possibilities are determined by the actual contexts in which they are discovered For each context exhibits recurrent characteristics or relatively stable tendencies on which its possibilities depend By virtue of these defining characteristics or tendencies, the possibilities permitted in one context are withheld in another Thus impossibility is necessarily involved in the mutual exclusiveness of different contexts But it is also by virtue of these same characteristics or tendencies that one context may be included within a wider context We are thus led to distinguish those more general and comprehensive settings which we dignify with the name of "realms" It is not my intention here to explore these "realms" or to list the characteristics by which their possibilities are determined Such an attempt would involve nothing short of a complete system of metaphysics In speaking of a "realm of possibility," however, I do not mean any transcendental domain, whose laws impose an a priori necessity upon experience On the contrary, a "realm" is to be regarded as a general type of structure discovered in actual tendencies, so related as to form a significant whole There are no characteristics of the "realm" apart from the uniformities displayed by operations or activities within it

Among these more pervasive and comprehensive contexts, certain broad divisions are discernible From these a tentative list of realms might be drawn up in an order of increasing complexity.

1 *The realm of discourse* as the realm of logical and mathematical possibilities These are all schematic, hence absolute, in that they refer primarily to the *arrangement* of all other meanings or possibilities in conformity with the rational structure of discourse

2. *The physical realm,* embracing the possibilities of all mechanical and chemical actions

3. *The realm of life,* including possibilities of organic evolution and individual growth Two kinds of possibility may be distinguished here. individual *capacities* (ontogenetic) and generic *potentialities* (phylogenetic).

4. *The social realm,* as any context of moral, legal, and economic possibilities, arising out of the actual organization (or disorganization) of human interests.

5 *The realm of imagination,* representing the possibilities in all artistic production, as well as the ideal constructions of mythology, poetry, and fiction

The possibilities included under (1) have no temporal or spatial reference, although they may signify schematic arrangements of spatial and temporal possibilities Those included under (2), (3), and (4) imply a common order of events in space and time, in which they are placed and dated Those included under (5) present special difficulties I would suggest that, while they *may* have a temporal or a spatial reference (or may not), nevertheless they imply no *common* order of events in space and time, according to which they may be placed or dated In other words, the place and time of an imaginary situation are wholly internal to its specific context and do not imply spatial or temporal relations with affairs in other contexts, whether imaginary or existent.

V

Every possibility has an objective reference that goes beyond a specious present But its locus or source of reference is in some present state of affairs [23] Elsewhere I have contended that every actual or present state of affairs which we may investigate or describe, consists in a process of transformation It was maintained that there are four principal factors involved the process conforms to a *structure,* it occupies a *field,* it exhibits a *functional unity,* it terminates in a *concretion,* either in discourse or in existence Furthermore, there is interaction among various transformations in different contexts and at different levels of organization within the same context. For this reason, we find interpenetration and overlapping, as well as mutual limitation, of processes with respect to each of the four factors.[24] The *structure* of any transformation, as formulated in general laws, defines its absolute pos-

[23] Compare G H. Mead, *The Philosophy of the Present*

[24] *Univ Calif Publ Philos*, XI, 127.

sibilities within an actual context—logical, physical, biological, social, or imaginative Its *field* represents the range of relative and variant possibilities which the actual process permits The *function* of a transformation is the correlation of these variant possibilities according to the limiting conditions of the context A *creation* is some determinate value which a function assumes as the outcome of the process

I have argued that impossibilities are necessarily involved in the mutual exclusiveness of different realms or contexts of possibility, that the limits of what is possible are set by the incompatible functions of present activities This statement, however, is subject to certain qualifying conditions, with a brief description of which I shall conclude

1 *Multiple contextuality*—No realm or context of possibilities should be considered an *absolutely* self-inclosed and exclusive system, since its characteristics are implicated in the conditions for the realization of possibilities in other realms or contexts Thus, man as a living organism, with his possibilities of sentient and rational activity is also a physical body interacting with other bodies in space and time under the conditions of his physical environment The realization of his vital and social potentialities implies the structure and functions of his activities as a member of the physical realm Any single process of transformation may permit possibilities or acquire meanings in many contexts Failure to recognize this multiple contextuality gives rise to what R B Perry has called "the fallacy of exclusive particularity"

2 *Intrinsic differentiation of structure*—It is not *only* the mutual exclusiveness of contexts that determines the limits of possibility Within a given context there are subordinate patterns of organization which permit certain possibilities and withhold others Thus, in the whole realm of logical and mathematical possibilities, we can distinguish between the context of Greek mathematics and the context of modern mathematics. Operations that were relatively impossible under the conditions of the former are possible under the different conditions of the latter, although both share the characteristics of the wider context of the mathematical sciences in general [25] The intrinsic differentiation of structure

[25] "What is a possible operation, or what is an impossible one, does not depend upon any absolute criterion of possibility, but upon the character-

within a given context gains increasing importance in the social and imaginative realms of possibility One type of life and character, because of its intrinsic pattern of organization, will permit possibilities that another type withholds The forms and standards of one art will permit possibilities of production that are impossible in a different art Even in the work of an individual artist, it seems likely that there are intrinsic differences of pattern which permit and withhold certain possibilities It is obvious that some of the musical themes of a modern composer like Schonberg or Alban Berg would have been impossibilities for a Beethoven symphony.

3 *Extrinsic integration of functions* —The functional possibilities of things in one realm or context exclude some as irrelevant, which may nevertheless be included among the possibilities in another context Yet some of the most fruitful hypotheses in the history of science have been developed through the extension of functional possibilities from one context to another, leading to a wider integration of functions and the discovery of new variant possibilities We have only to think of the whole range of new possibilities opened up by the introduction of mechanical concepts into the field of thermodynamics, or, more recently, the use of concepts borrowed from the context of non-Euclidean geometry to reinterpret the laws of physics Whether any proposed integration of functions is valid or merely fanciful can only be determined experimentally It is difficult to draw the line in advance between a genuine extension of functional possibilities and a mere confusion of categories For in each context there are possibilities, both absolute and relative, which are excluded from the field of possible operations or events in other contexts In a context of imaginary beings, for example, states of affairs are permitted which are completely withheld from any physical context There is, moreover, a kind of necessity and coherence in the characters of imaginary beings. They remain "true to form" within their appropriate contexts.

istics of the domain in which operations are carried out; the possibility or impossibility is in fact relative to a particular domain. So long as the domain was that of a signless number, the operation of subtraction was not always a possible one, for example, 3 – 5 represented an impossible operation, and could only be taken to represent an 'imaginary' number, in relation to the domain Similarly, the operation of extracting a square root of a negative number is only impossible within the domain of real number; it becomes a possible operation within the enlarged domain of complex number."—E. W Hobson, *The Domain of Natural Science*, p 117

Superstition, in contrast to science, is simply the attempt to substitute ideal possibilities in an imaginative setting for the actual conditions of the physical world Such confusion of context is one source of the belief in miracles and supernatural interventions A miracle is a relative impossibility in one context taken as a sign of absolute necessity in another

> So soon as man ceases to be wholly immersed in sense, he looks before and after, he regrets and desires . The *Life of Reason* will then be a name for that part of experience which perceives and pursues ideals—all conduct so controlled and all sense so interpreted as to perfect natural happiness [26]

In these words, Santayana has expressed what might be called the *evidence* of possibility in human experience To say that man is the kind of animal that "perceives and pursues ideals" is to say that he lives in the presence of possibilities, which objectively shape his thought and guide his actions Without possibilities, genuinely discovered and not merely fabricated by our thinking, intelligence would be futile But the Life of Reason is also a name for that part of experience which discerns and wisely acquiesces in the actual limits of possibility

[26] Santayana, *The Life of Reason*, I, 2, 3.

POSSIBILITY AND SIGNIFICANCE

BY

PAUL MARHENKE

POSSIBILITY AND SIGNIFICANCE

PAUL MARHENKE

THERE ARE TWO TRUISMS which philosophers habitually either forget or ignore The first truism is that every question has an answer We may not be able to decide what the correct answer is, but even the reply that we do not know what the answer is or that we cannot make up our minds about it presupposes that the question has an answer The second truism is that no question has an answer unless the question be significant The decision that a question is significant is obviously not made by the mere fact that we raise our voice at its end. A great many philosophical debates would terminate at once if the debaters were not taking it for granted that this fact constitutes a sufficient criterion of significance In order to determine, then, whether a question is significant, it is necessary to have a criterion of significance.

When we ask the question "Do lions exist?" our question has a determinate and unambiguous meaning or significance The criterion of significance that is presupposed by this question is the following We are able to state the circumstances under which we could say that we had verified the proposition, "Lions exist" Since the question has a determinate meaning it is obviously capable of a determinate answer If anyone has ever observed the character of being a lion exemplified in a particular the answer is "yes," otherwise it is "no" or "maybe" We must not suppose, however, that the criterion of significance I have stated is the only one of its kind There are other criteria by which we could determine whether a question, and in particular whether the question under consideration, is significant or not I merely assert that the criterion stated is the one usually presupposed when we say that this question can be answered That there are different criteria of significance can be shown by the following considerations. Take the proposition, "Lions are possible." We might say that this is significant if we can state the circumstances under which the proposition

"Lions exist" could be said to have been verified This condition fulfilled, the possible becomes identical with the significant and the impossible with the nonsignificant or meaningless If therefore the proposition "A is impossible" is to be significant, we are in need of a criterion by which we can determine whether "A" is significant or not Hence the proposition "A is impossible" cannot be equivalent to the proposition "A is nonsignificant," for unless "A" is significant this proposition is also nonsignificant

The meaning of the question "Are lions possible?" is capable of a number of different specifications The answer to the question therefore depends on the criterion of significance that we select This is not always kept in mind when questions regarding possibles are discussed, otherwise philosophers would cease debating the question whether round squares are possible or not If the disputants did take the trouble of specifying exactly what they take the question to mean, they would either agree upon an answer or decide that they were not discussing the same problem They would find that what is possible when the question has been given one specific sense may also be impossible when the meaning of the question has been differently specified In addition to the philosophers who think that the question of the possibility or impossibility of round squares is debatable, there are of course those philosophers who hold that the sentence "Are round squares possible?" is meaningless We think we are asking a meaningful question, so these philosophers tell us, because we raise our voice at the end of this sentence or because it has the same form as the significant sentence "Are lions possible?" In reality we are giving utterance to nonsense, because the notion of round squares is self-contradictory

We have said that the possible and the impossible cannot be identified with the significant and the nonsignificant, respectively For if this identification be made, the proposition "A is impossible" can be significant only on condition that it is false, that is, that the proposition "A is possible" is true But this proposition is significant even if true, and this fact requires that "A" be significant The decision whether "A" is significant or not is made by means of some criterion of significance This criterion determines the class of significant terms as well as the class of terms which are nonsignificant Within the class of significant terms the possible and the impossible are distinguishable species This distinction is

effected by the addition of differentiating conditions to the initial criterion of significance If "A" satisfies the conditions of this second criterion, "A" is possible, if not, it is impossible This second criterion, then, which distinguishes possibles from impossibles within a given genus of significance can in turn be taken as a condition of significance Within the class of significant terms that is determined by this criterion, a further separation of possibles from impossibles can be made in the same manner as before. If, therefore, we insist on making the identification of the possible with the significant and of the impossible with the nonsignificant, this identification must be understood in the sense indicated The possible as the significant and the impossible as the nonsignificant are both subclasses of the significant

There is one condition of significance which is quite ultimate and is in fact presupposed by the different criteria of significance that I propose to examine so far as these criteria are philosophically important This is the significance of what we may here call simple signs Certain signs are said to be significant because they symbolize or represent factors within our experience We know what is meant by the sign "red" because we have verified sentences of the form "x is red " Similarly, we know what is meant by the sign "to the right of," because we have verified sentences of the form "x is to the right of y " The sign "red" then derives its significance from its occurrence in a verified sentence In general, signs that symbolize qualities and relations are significant because sentences in which these signs occur symbolize facts with which we are or have been directly acquainted The significance of simple signs I propose to call primary significance

There are other signs the significance of which is derivative from the significance of simple signs These signs I propose to call complex signs and their significance secondary significance Not every complex sign, however, has secondary significance even though its components have primary significance If a complex sign be composed of several signs that are arranged contrary to the rules of syntax, then the complex sign shall not be said to have secondary significance The significance of complex signs is therefore subject to a certain limitation A complex sign need not be composed of several signs The sign "unicorn," for example, is complex, since we have not verified a sentence of the form "x is a unicorn." But we

nevertheless say that this sign is significant because its significance is analyzable into the significance of simple signs Similarly, even such signs as "round square" and "square virtue" qualify as significant signs, for these signs have been constructed in accordance with syntactical rules, and the significance of their components is analyzable into the significance of simple signs

Significance, both primary and secondary, is, then, a property of certain particulars which we call signs If we define a sign as a significant mark, then the term "nonsignificant sign" is of course a *contradictio in adjecto* Hence, by the term "sign" I shall mean a mark which either is significant or nonsignificant But this definition is again open to the objection that the term "nonsignificant mark" is also a *contradictio in adjecto* In order to state quite clearly what I do mean, I must be somewhat prolix There are certain visible, audible, and touchable particulars, written by someone, printed by someone, spoken by someone, or executed by someone which have either primary or secondary significance There are certain other particulars, originated in the same way as the former set, which resemble the former set of particulars in that they are analyzable into the same or similar elements, but they are not significant The term "sign," then, shall refer to any member of these two classes In other words, the term "sign" refers to the genus of which significant signs and nonsignificant signs are the species

Signs may be divided into two groups, sentences and signs other than sentences Sentences are constructed out of signs other than sentences I shall not here raise the question, Can a sign be significant independently of its occurrence in a sentence? But signs other than sentences do occur or can occur in sentences The significance of signs independently of their occurrence in sentences need therefore not receive separate treatment It is sufficient if we consider their significance in sentences

A sentence is a sign that has been constructed in accordance with the rules of syntax. The significance of a sentence or of a part of a sentence could therefore be identified with its grammatical structure All sign-structures resembling sentences or parts of sentences, but violating one or more of the rules of syntax, are nonsignificant with respect to this criterion According to the syntactical criterion of significance the sentences that constitute the

poem "Jabberwocky," and the similar sentences that are found in the writings of James Joyce and Gertrude Stein, are all sound sense, even though they are constructed out of signs that have neither primary nor secondary significance, while many of the sign-structures recorded by students of philosophy in their blue-books are nonsense, even though the signs of which they are composed all have either primary or secondary significance.

Syntactical structure is then the first criterion by means of which one can distinguish—as a matter of fact, does distinguish—between significance and nonsignificance, between sense and nonsense The determination of the significance of a sign-structure by the application of this criterion is obviously quite independent of the possession by its components of primary or secondary significance It is sufficient to know the rôles played by the various signs; that is, what is noun, adjective, verb, preposition, etc If the signs that play these rôles perform the functions that are assigned to them by the rules of syntax, then our sign-structure is a sentence. Of course if the sign-structure contains components that do have primary or secondary significance, as do the sign-structures of "Jabberwocky," for example, our deciding whether the sign-structure is a sentence or not is facilitated by the presence of such signs In other words, the sentences of "Jabberwocky" have the form of propositions They are in fact derived from propositional functions by supplying nonsignificant signs as arguments Unless, in short, some of the signs are significant, we should need the aid of the author of the sign-structure in order to decide whether the sign-structure is a sentence or not

Syntactical significance and nonsignificance are of no philosophical interest My excuse for mentioning them here is the necessity of having a complete catalogue of what has been called sense and nonsense Also the classification has a certain heuristic value, for it limits any further determination of the conditions of significance to the sign-structures that are significant according to this first criterion

I have already indicated what the next condition of significance must be It must enable us to relegate to the class of the nonsensical the sentences of James Joyce and Gertrude Stein (some of them, at any rate), while leaving significant the sentences of less advanced authors The criterion that will do this may be stated as

follows A sentence is significant if it consists of signs that have either primary or secondary significance

I am in a position now to illustrate the relation between significance and possibility Suppose we consider the question "Are slithy toves possible ?" Before we can decide whether they are possible or not, we must determine whether "slithy toves" is a significant symbol The first criterion of significance enables us to make this determination The question we have to answer is, Do the rules of grammar permit the modification of a noun by an adjective? The answer being in the affirmative, we can proceed to the further question whether slithy toves are possible or not Here we invoke the second criterion This criterion enables us to distinguish possibles from impossibles "Slithy toves" being a sign that has neither primary nor secondary significance, the decision is against the possibility of slithy toves The possible and the impossible are thus species of the significant

The next separation of sense from nonsense is made by the doctrine of types Mr Russell defines a logical type as follows

A and B are of the same logical type if, and only if, given any fact of which A is a constituent, there is a corresponding fact which has B as a constituent, which either results by substituting B for A, or is the negation of what so results [1]

It follows from this definition that when two signs signify different types, the relations of the signs to what they signify are also of different types In order to illustrate what the doctrine of types asserts, let us demonstrate this consequence Let a and b be signs and v and w the entities they signify Let R and S be the relations between a and v, and b and w, respectively By assumption, aRv and bSw both express facts Also by assumption, v and w are of different types We have to show that aSv does not express a fact and that its denial likewise does not express a fact Now, since a and b are of the same type (all signs being of the same type), there either is a fact aSw or else it is false that there is such a fact. But since v and w are of different logical types, there is no fact which is expressed by aSv, and there is no fact which is expressed by the denial of aSv. The relations R and S are therefore of different types

[1] *Contemporary British Philosophy*, First Series, p 369

In another place Russell has defined a type as the range of significance of some function, the range of significance being defined as the class of values of the variable for which the values of the function are either true or false The values that may be supplied as arguments to a function are not any values, but must be of appropriate type If we choose a value as argument that belongs to a different type the resulting sentence is nonsignificant A few examples will make this clear Consider the function "x is red " The values of "x" that may be supplied as arguments to this function are particulars But this alone is not enough, the particulars which belong to the range of significance of this function must either all be colored or at least possess all those characteristics which are presupposed by the characteristic of being colored The first condition renders the sentence "Green is red" nonsignificant, while the second one determines the sentence "This sound is red" also to be nonsignificant Since the negation of a proposition is a function of that proposition. the negation of these sentences must also be nonsignificant If, for example, the sentence "This sound is not red" were significant, its equivalent "It is false that this sound is red" would also be significant But the latter sentence is obviously nonsignificant, since it contains a nonsignificant sentence. Consider next the function "x is square " The values of "x" that may be supplied as arguments to this function must all have the characteristics that are presupposed by the characteristic of being square This condition renders the sentence "Virtue is square" as well as the sentence "Virtue is not square" nonsignificant, since an analysis of the notion of virtue does not disclose any characteristics that are identical with the characteristics that are presupposed by the characteristic of being square

I have now said enough to indicate that the doctrine of types is a plausible doctrine A detailed defense of it requires technical resources which it is here unnecessary to develop. But I think that we shall not go very far wrong if we say that particulars such as sounds and colors belong to different types because an analysis of the characteristics of sounds and colors does not disclose any characteristic that is common to both Things can belong to the same type only if there is at least one characteristic which belongs to both The determination of the range of significance of a function therefore appears to be an analytical matter We take an argument

that satisfies the function and compare its analysis with the analysis of the value that is proposed as argument to the same function If this analysis yields any characteristic that is common to the two, then they belong to the same type, if not, they belong to different types

The condition of significance demanded by the doctrine of types determines a further separation of possibles from impossibles Possibles satisfy the requirements of the doctrine of types, impossibles do not "Square virtue" is rendered impossible by these requirements, while "round squares," on the contrary, remain within the realm of the possible As we pointed out before, this separation of possibles from impossibles presupposes that signs such as "square virtue" and "round square" are significant The criterion of significance that is here involved is the second one, with respect to which we made our first separation of possibles from impossibles

Since the relation of the possible and impossible to the significant is the same at each level of significance, it is unnecessary from now on to specify exactly in what sense the possible can be identified with the significant and the impossible with the nonsignificant It is sufficient if we indicate the general scheme of this relation Suppose, then, we have reached the criterion of significance $Sn-1$, where the index indicates the order of the criterion This criterion determines whether the question regarding the possibility or impossibility of "A" (where "A" may now be supposed to have either primary or secondary significance) is significant or not We now select a criterion of significance Sn which consists in a further determination of the criterion $Sn-1$ The criterion Sn then enables us to divide possibles from impossibles within the region of the significant as determined by $Sn-1$ Exactly the same procedure is repeated within the region of significance determined by Sn by selecting a criterion of significance $Sn+1$, which is a further determination of the criterion Sn That is to say, the region of significance determined by Sn is the region of the possibles within which a further separation of possibles from impossibles is made by employing a criterion that is obtained from Sn by adding further determinations to it

The fourth criterion of significance is then obtained from the third by adding a further condition to the criterion supplied by the doctrine of types This further condition is the requirement

that our symbols be consistent The determination of the consistency of our symbols is made by the law of contradiction This law therefore constitutes the fourth criterion of significance "Round squares," which are significant according to the third criterion, are nonsignificant if we add the further condition that a concept must be self-consistent in order to be significant Using the criterion in turn to distinguish possibles from impossibles, we get the result that "round squares" are impossible, while "extended red things" and "wealthy rich men" remain as possibles

Our next criterion must therefore be such that it will rule out the last-mentioned possibilities To consistency we shall have to add that our terms be nontautologous All signs the primary or secondary significance of which involves a tautology are to be classified as nonsignificant It is not necessary for our purpose to make a distinction between those tautologies which are analytical propositions or are derived from analytical propositions and the wider class of noninductive generalizations which includes such propositions as "Red differs from green" and "Whatever is red is extended " It has been suggested that these propositions are tautologies in disguise I do not know of any proof which demonstrates them to be tautologies, but for the sake of this discussion I shall assume that an analysis of them would show this to be true The criterion under consideration then, determines that both "wealthy rich men" and "extended red things" are impossible

The sixth condition of significance narrows the class of sentences down to those that express matters of fact, that is, to a posteriori or synthetic propositions A synthetic proposition is significant if it is verifiable, that is, if we can specify the conditions under which we could say that we had verified it If the conditions of verification cannot be specified, then the proposition is nonsignificant A great many of the propositions of metaphysics are nonsignificant, according to this criterion Take such a proposition as "Matter is infinite " Presumably this means that the number of material particles is infinite. This proposition is not verifiable, as it requires us to be able to count an infinite number of particles Every inductive generalization presupposes a finite number of inducing cases if it is to satisfy the condition of significance under consideration. In order that an inductive generalization be significant it is moreover necessary that the inducing cases be contained within spatial

and temporal limits The proposition that all men are mortal is theoretically verifiable if we can examine all the inducing cases. They can all be examined if they are all located within assigned boundaries The proposition seems as a matter of fact to presuppose such limits. Presumably the men it talks about are all to be found on the earth, or at least within the planetary system That the aggregate of men is also confined within temporal limits is not so obviously presupposed But just as obviously we could not say that we had verified the proposition if outside all temporal limits no matter how far these be extended into the past and the future there are always to be found more men For a statement about an infinite aggregate, where each member of the aggregate has to be examined in respect to the possession of a certain property, is not verifiable, and neither is a statement about a finite aggregate if we do not know within what spatial and temporal limits the aggregate is to be found, since we cannot know that the aggregate is finite unless this condition be satisfied

According to the sixth criterion, then, the concept of an infinite number of material particles represents an impossibility But so does the concept of a world consisting of a finite number of such particles, if the spatial limits of such a world remain unspecified Such concepts as "unicorn" and "green-skinned man" represent possibles.

It is not advisable to continue the dichotomous division of successive regions of significance into possibles and impossibles when we reach the sixth criterion Instead I shall discuss a number of alternative classifications which all presuppose this criterion of significance One might suggest that when we have reached the stage of empirical propositions we are precluded from making any further distinction of sense from nonsense But this would be a mistake, the nonsensical has many mansions, as I have already sufficiently demonstrated Some of its mansions are even located in an area which some philosophers have lately declared to be the final and exclusive domicile of the significant. As proof of this contention I need only point out that philosophers make a distinction between genuine and spurious possibilities, and that spurious possibilities are sometimes identified with the nonsensical

But before I go on with the examination of the alternative classifications of this region of significance into possibles and impossibles

I want to raise a question which has been ignored so far, but which now calls for an answer The question is this What precisely is being asserted in the statements that we have considered when we say that "A is possible" or that "A is impossible " To this question I now turn

Possibles, we have seen, are a selection from a collection of alternatives There are always two questions, then, that must be decided How are the alternatives determined ? and How are the possibles to be distinguished from the impossibles ? The game of chess illustrates quite clearly how these questions are answered There are sixty-four alternative moves that can be made with each piece, if we count the leaving of a piece on a square on which it stands as an alternative move These alternatives are determined by the general requirement of the rules that the game be played on a board divided into sixty-four squares, and that removing a piece from one square and placing it on another or refusing to move it from a square already occupied by the piece shall constitute a move But not all these moves are possible moves The possible moves are determined by the specific rules of the game The moves, then, that are incompatible with the rules of the game are the impossibles moves Besides possible and impossible moves there are of course also absurd or nonsensical moves Thus, if I should move a piece off the board or place it at the intersection of the boundary lines of the squares I should be executing a move that is not contemplated by the rules of the game

This account of the possible as a selection from alternatives exactly parallels the account we have given of the relation of the possible to the significant The alternative moves in chess might be called, and perhaps are called, signifieant moves, a signifieant move being a move on the board Nonsignifieant or nonsensical moves are moves not contemplated by the general requirements of the game But a possible move might also be called a significant move, a move being signifieant if it is made in accordance with the rules of the game We need not repeat here in what sense a move may be both significant and nonsignifieant, a move that is nonsignificant in the limited sense must also be signifieant in the wider sense

In order to show that possibles and impossibles are always selections from a collection of alternatives, I now propose to recapitulate the results we have obtained so far

1. The first set of alternatives from which possibles and impossibles are to be selected are signs that have grammatical significance Possible and impossible signs or combinations of signs are distinguished with respect to the condition that possible signs must have primary or secondary significance The propositions "A is possible" and "A is impossible" are therefore propositions about signs Thus, the proposition "Square virtue is possible" means that "Square virtue" is a possible combination of signs, while the proposition "Slithy toves are impossible" means that "Slithy toves" is an impossible combination of signs

2 The second set of alternatives, or the class of concepts, is determined by the condition that no sign shall belong to the set unless it have primary or secondary significance The separation of possible from impossible concepts is then made by means of the doctrine of types "Round squares are possible" means that "Round square" is a possible concept

3 The third set of alternatives consists of concepts which are permitted by the doctrine of types Possible concepts are distinguished from impossible concepts by means of the Law of Contradiction. The requirement of this law makes round squares impossible, while tautologous concepts such as "Wealthy rich men" remain within the possible

Philosophers can be divided into two groups—those who believe that round squares are thinkable, and those who hold the contrary opinion The disputants argue at cross-purposes so long as they do not bother to define what they mean by "thinkable" We have attempted to supply these definitions "Round squares" are possible or thinkable relative to one condition, and impossible or unthinkable relative to a more specific condition In the words of Mr. Stout "an impossibility can be thought of only because, from another point of view, it is a possibility"[2] Mr Stout proposes a solution of the difficulty along the lines I have suggested He writes

In one sense, we cannot apprehend the union of two contradictory propositions in a single proposition, for it is in the act of failing to do this that we become aware of the law of contradiction as self-evident On the other hand, if we could not think of the union of contradictory propositions at all, we could never recognize it as an impossibility. The solution of the difficulty seems to be this The general character of the propositions, considered merely as propo-

[2] *Proc Aristotelian Soc*, New Series, XI, 193

sitions, leaves open the alternative possibility of their being combined or not combined Hence from this point of view we can think of their union as a possible alternative It is only when we go on to develop our thought in the attempt to bring before the mind the special form which this alternative would assume under the special conditions, that we find our path barred We can think of the two propositions being united in a single proposition But when we ask what proposition would fulfill the special conditions, we find, not a thought, but a blank failure to think [3]

That some such solution as this is the right one is shown by the fact that there are mathematical impossibles which are not so obviously self-contradictory as the concept of the round square The trisection of an arbitrary angle, for example, can be demonstrated to be impossible But obviously one cannot demonstrate the impossibility of trisecting an arbitrary angle unless the problem is at least significant Nonmathematicians undoubtedly exist even now who, unable to comprehend the demonstration, consider the problem to be significant and work on its solution The trisection of an angle is therefore from another point of view a possible concept It is only when we develop the concept, as Mr Stout expresses it, that the contradiction comes to the surface, and that the concept of the trisection of an arbitrary angle joins the rank of impossibles. These examples may be extended indefinitely I mention only two out of a long list the rationality of the ratio between the circumference and the diameter of a circle, and the demonstrability of the axiom of parallels In every example the concept is significant or possible, since it satisfies the general requirements that govern the formation of concepts, and, in the example under consideration, of mathematical concepts

4 The fourth set of alternatives consists of concepts that have the property of consistency The distinction of possible from impossible concepts is then effected by the Law of Tautology. It might be objected here that we are pressing the distinction between possibles and impossibles too far on the side of logic, that we should have stopped the analysis at the preceding level How can "wealthy rich men" who are possible at the preceding level also be impossible at the present level? This is the same type of objection that was previously raised against the possibility of round squares There the possibility, here the impossibility is objected to, while the pos-

[3] *Ibid*, 194

sibility here and the impossibility there are found unobjectionable. The solution of this difficulty would therefore seem to be exactly parallel to the solution in the preceding one Since it is true to say that rich men are possible, it must be true that wealthy rich men are possible, since every rich man is wealthy With respect to the general requirement of consistency, then, wealthy rich men are possible But the question "Are wealthy rich men possible?" might be understood in this way Is it possible for a man to be both rich and wealthy, can a man have the property of being rich in addition to the property of being wealthy, just as he undoubtedly can have the property of being generous in addition to that of being wealthy? Here the answer is of course in the negative, it is impossible that a man should have the property of being wealthy in addition to the property of being rich Relative to the requirement, therefore that the qualifications of a concept must be synthetic, wealthy rich men are impossible

5 The fifth set of alternatives is determined by the condition that every concept that is a member of the set shall have in addition to the property of consistency the property of being non-tautologous The distinction between possibles and impossibles is then effected by the condition that possible concepts have the property of verifiability That is to say, the proposition "A is possible" will be true if we can state the conditions under which the proposition "A exists" could be said to have been verified If we cannot state these conditions, then the proposition "A is impossible" will be true Thus, green-skinned men are possible, since we know what we should have to find if we were to verify the proposition "There are green-skinned men," while an infinite world is impossible, since we cannot specify what we should find if we were to verify the proposition "The world consists of an infinite number of material particles"

6 The sixth set of alternatives is determined by the condition that every concept that is a member of the set shall be verifiable. The alternatives we have reached are usually divided into a set of spurious and a set of genuine possibilities A spurious possibility is a possibility which the actual world in some way excludes, which could not exist, while a genuine possibility is one that could be a member of the world, one that could exist A genuine possibility remains of course no less genuine even if it never does exist If then

the distinction between genuine and spurious possibilities is to be maintained, membership in the actual world must be determined by conditions If we know the conditions, we can decide. in theory at least, whether a proposed possibility is spurious or genuine In practice the decision would be contingent on the degree of complexity of the conditions If this degree exceeded a certain limit the decision might become impossible, because it presupposes technical resources which we do not possess

How then shall we specify the conditions for membership in the actual world? We might try to answer this question by having recourse to the expedient of making an inventory of the different kinds of things and events in the world The kinds of things that have occurred and the kinds of events that have happened we might then say are genuine possibilities, while any possibility contemplated by the mind of man that is not represented in this inventory by at least one example is spurious This criterion of the genuinely possible will undoubtedly be thought to restrict the range of the genuinely possible too rigidly We are fairly certain that fairies and golden mountains are spurious possibilities, but we are not so confident what our decision should be when we are considering the possibilities imagined by a breeder of fruits or flowers. And often our confidence is misplaced Before the advent of aviation there were people who thought it impossible that man should ever be able to lift himself off the ground in a device heavier than air The criterion under consideration then does not go very far in distinguishing spurious from genuine possibilities An enumeration of the things and events that the world contains does determine what is genuinely possible, but it does not divide the possible into two mutually exclusive sets of spurious and genuine possibles

We might try next the expedient of defining the genuinely possible as that which is compatible with the known laws of nature But here we have to distinguish between two alternatives On the first alternative, A is possible if A is a specification of the laws of nature, impossible if it contradicts these laws On the second alternative, A is possible if A is independent of the laws of nature. That a candle should stay lit in an elevator that is falling with the acceleration of gravity is impossible, relative to the known laws of nature These laws declare that combustion can take place only in the presence of oxygen, and that carbon dioxide is one of the prod-

ucts of combustion, but an elevator that falls in the gravitational field of the earth is a system whose parts are not acted upon by gravitational forces relative to the elevator, and the candle will therefore have to go out, because it is smothered by the carbon dioxide that accumulates around the flame In the same way the known laws of nature determine what is possible That a man should grow to the height of a giraffe is not inconsistent with known laws and is therefore possible That he should grow to the height of a mile is impossible Such a man could exist only on the supposition that the laws of mechanics are false But known laws do not determine within what range of colors the color of his skin must fall The color of a man's skin is not connected with other characteristics of his organism by any known law Hence, a green-skinned man is a genuine possibility relative to known laws The known laws of nature do of course put a limitation on some of the properties that such a man might have If he is to possess the biological and anatomical characteristics that are found in men of ordinary size he cannot exceed a certain height without his being rendered impossible by the laws of mechanics A possibility is therefore to be considered as independent of the known laws of nature even if its independence is only partial No genuine possibility can of course be completely independent of known laws But its independence might very well be partial

The laws of nature, then, do enable us to distinguish spurious from genuine possibilities, but they do not determine these two classes definitively A green-skinned man is a genuine possibility relative to known laws He may be a spurious possibility relative to a more inclusive knowledge of nature's laws Every increase in our knowledge of the laws of nature contracts the region of the genuinely possible In addition to this difficulty there is the further obstacle that we may not have the requisite abilities for determining whether an alleged possible is spurious or genuine And even if we do have the requisite abilities we may make mistakes Whenever we are concerned with remote consequences of a law or set of laws we are confronted with this hazard People who used to maintain that flight in an aeroplane was impossible, were mistaken if they meant to assert that such a feat was precluded by the laws of nature that were known when they advanced this contention They would have been thought wiser if they had kept their counsel

Keeping our counsel is undoubtedly the best policy we can adopt on many occasions when we are confronted by the question of the spuriousness or genuineness of a possibility

The possibilities with which we are concerned in the a priori determination of probabilities are always independent of the laws of nature I do not mean that the position which a tossed coin, for example, will take on a flat surface is not determined by its mechanical state when it leaves the hand We are convinced, on the contrary, that the future state of a tossed coin is a function of its earlier states But we do not know how to determine this function In other words, we do not know the law that connects the initial state of the coin with its final state If we did know it we should be able to decide whether the proposition "Heads is a possible throw" is true or false Thus, if I should ask, "Is it possible for a falling body to reach the position P' from the position P in five seconds?" the answer to the question is determined by the law of falling bodies This law, as Mr Lenzen has expressed it, determines the possible positions of a falling body But we know of no law which determines the possible states of a tossed coin We do have partial knowledge of the determining conditions, to be sure We know, for example, that the coin will not stay suspended in midair This possibility is ruled out by the law of falling bodies When I say, therefore, that the possible states of a coin are independent of the laws of nature, I take this proposition to be compatible with the admission that the possible states of a coin are partially determined by the known laws of nature The possible throws with a coin are, then, determined a priori, subject to the following conditions: (1) Whenever a coin is tossed it will come down on the table (2) Whenever a coin is tossed it will not come down on its edge The second condition is presupposed, and we assign equal probabilities to the two possibilities which then remain, in order to bring these probabilities into accord with the actually observed frequencies

It remains to discuss the general conviction that certain possibilities must be ruled out as spurious because they are precluded by natural laws, although our ignorance of these laws does not permit us to assert with absolute assurance that they are spurious. Nature, we observe, acts in a uniform manner; certain sequences of events and correlations of characters are constantly repeated. Thus we reach the conviction that these regularities result from

the operation of laws A man's legs, for example, grow until they reach the length of three or four feet, his nose does not attain that length Hence, we begin to suspect that there are biological laws which control the respective lengths to which his nose and legs can grow This is of course the familiar argument for determinism It must not be confused with the naive contention that a man with a nose three feet long is an impossibility because such men have never been observed to occur The present argument is much more subtle Its contention is as follows If the regularities that are found in nature are not determined by laws then there is no explanation for them There is no reason, then, why a man's nose should cease growing after its length has reached a certain limit The fact that it invariably does so must be ascribed to chance And if the length of men's noses is determined by chance, then why do they not sometimes grow to the length of three feet? Since they do not, the regularities we have observed in nature must be the expression of laws If so, there are possibilities which are incompatible with these laws and are therefore spurious

This does not mean that a genuine possibility must also be actual The "merely" possible is sometimes condemned by the following dialectical argument If the possible is not somewhere at some time also actual, then that fact demonstrates it to be impossible Every possible therefore must be actual Taken in connection with the definition of the impossible as that which is incompatible with the laws of nature, this argument presumably makes the following contention If an alleged possible is not actual at some time in some place, that is because the alleged possible is really incompatible with the laws of nature An analogous objection to possibles takes the following form On the supposition that determinism is true a superscientist who knows all the laws of nature would be able to predict every event in nature For him there would be a distinction between the actual and the impossible, but none between the actual and the possible Every alleged possible must either be identical with some event in nature, and therefore actual, or with an impossibility, that is, with a spurious possibility excluded by the laws of nature

Both of these arguments are fallacious The laws of nature do not assert that there is anything actual, they express the conditions to which anything that is to qualify as an actuality must con-

form Thus the law of falling bodies asserts that the successive positions of a falling body are determined by the formula $s = 1/2gt^2$, but it does not say that there are any falling bodies In other words, a law of nature is a hypothetical proposition Anything that can be subsumed under the hypothesis can also be subsumed under the thesis In general a causal law is an expression in which certain variables $x, y, z,$ are determined as functions of other variables $t, u, v, w,$. But in order to use such a formula for making predictions I have to give values to some of these variables These values are obtained from observations of the actual world

Causal laws must be distinguished from the principle of causality The principle of causality asserts that every event is completely determined This assertion has the following meaning A superscientist who knew all the laws of nature and the state of the universe at a given moment, would theoretically be able to predict the state of the universe for any other moment past or future The prediction of events, then, requires the satisfaction of two conditions (1) It requires causal laws (2) It requires the observation of constants which can be substituted in these laws Let us call these constants the initial conditions The laws then determine merely what can happen, the possible happenings in the world They and the initial conditions determine what does happen The initial conditions are determined by what the actual world contains But we could also determine them ourselves The laws of nature, then, plus the initial conditions as determined by us determine a hypothetical world, a possible world The laws of nature are the invariant structure of the different possible worlds that can be obtained by varying the initial conditions Whenever we raise questions about possibilities that are contrary to fact, we have this concept of possible worlds in mind For example, if the distribution of matter were different from what in fact it is, the past history of the world would have been and its future history would be different from what in fact it has been and will be

We are now ready to answer the arguments that were introduced a while ago Whatever does not contradict the laws of nature is possible In order that A be possible, therefore, A need never occur. Whether or not A will occur in the actual world, is determined by the initial conditions Let us suppose that these are such that A never does occur This fact is quite irrelevant to the question of

whether A is possible or not. If A is possible, if A does not contradict the laws of nature, it is also possible to excogitate a hypothetical world in which A does occur. That is to say, the initial conditions can be chosen in such a way that A is predictable in a hypothetical world the structure of which is determined by the laws of nature. In other words, if A satisfies the general requirements for admission into the actual world, then A is possible. The fact that A does satisfy these requirements is not contradicted by the further fact that A never occurs.

The second argument deprives the terms "possible" and "impossible" of all meaning. Every possibility is relative to some general condition. The possibilities which we have just been considering are relative to the laws of nature. That A is possible relative to the laws of nature means, then, that A is one of the alternative specifications of which the laws of nature are capable. That A is a possible move in chess means, for example, that A is one of the alternative ways in which the rules of chess may be specified. Similarly, by giving alternative values to the variables in a law we get the alternative possibilities which are compatible with the law. Hence, when a condition becomes completely specific, we can no longer ask significantly how this condition can be determined further, and therefore, whether there are alternative possibilities with respect to this condition. I can speak of possible moves with the knight if the rules of chess make provision for alternative moves with that piece. But obviously I could not speak of possible moves if the rules of the game should prescribe what moves must be made and in what order they shall be made. Whenever a rule becomes mandatory, there are no alternatives and the concept of possibility loses its significance. Similarly, then, if determinism be true, the laws of nature plus the initial conditions are incapable of any further specification. The laws and the initial conditions prescribe, so to speak, what the contents of the world shall be. There are no alternatives to the actual world and therefore no possibilities.

In order to find the laws of nature we depend on the observation of regularities. It sometimes happens, however, that what we took to be a regularity turns out not to be one. In such a dilemma we help ourselves by attempting to find subsidiary regularities in the observed regularities and irregularities. Hence, an observed regularity may be the expression of a natural law and again it may not

Where we find ourselves unable to distinguish between spurious and genuine possibilities on the basis of our knowledge of the laws of nature, the regularities we have observed nevertheless constitute a strong ground for making that distinction But they never constitute a decisive proof that a given possibility is spurious. We have too often found that what we declared to be impossible had no difficulty in becoming actual

A CONTEXTUALISTIC THEORY OF POSSIBILITY

BY

STEPHEN C. PEPPER

A CONTEXTUALISTIC THEORY OF POSSIBILITY

STEPHEN C PEPPER

PROFESSOR LENZEN has directed attention to a stratification of possibilities [1] There are possibilities of possibilities of possibilities passing down through various layers until an actual state of affairs is reached So viewed, the actual is simply the limiting layer at one extreme of a succession of layers of possibilities But it is unique in that it is the one stratum of possibilities where no alternatives are possible In all the other strata alternatives are defined, and the higher and more inclusive the stratum, the wider the range of possible alternatives In other words, all the higher strata of possibilities are determinables of various degrees of determinateness, the actual is the ultimate determinate

A situation is indicated here of great value toward a preliminary demarcation of the general field of possibility, and such a demarcation I think we should always attempt to make, before approaching any precise definition of a philosophic concept But the situation, as exposed in the preceding paragraph, leads into a serious ambiguity For in a manner which I think I can make clear presently, the actual is in greater opposition to the possible than is the impossible Or, to state the matter the other way round, there is a set of connotations such that the impossible is more possible than the actual For, according to that set of connotations, the actual is not even possible, it is The actual is neither possible nor impossible. It is not in any way hypothetical, it is categorical It is.

To straighten out this tangle of paradoxes, I am going to suggest a new term, which will envelop the three terms that so easily juggle themselves into one another's positions. I will suggest the term "specifiable" In place of the hierarchy of possibilities suggested by Professor Lenzen, I therefore offer a hierarchy of specifiables. The lowest level of this hierarchy is the actual All the other levels

[1] Present volume, p 57

are possibilities The difference between actual and possible can now be made out A possibility is a specifiable that admits of alternatives, an actuality is a specifiable that does not admit of alternatives The hierarchy of specifiables is simply the conception of alternatives having progressively a wider and wider range of application In actuality, which is the lowest level of the hierarchy, specification is so great that no alternatives whatever are admitted. As the degree of specification is relaxed, the range of alternatives increases, and this range of alternatives is what we regard as the possibilities for any particular degree of specification The specifications may be made less and less determinate to the theoretical point where no specifications are made whatever At this point the range of alternatives reaches its maximum, and we can say that literally anything is possible Let us call this highest level of specifiables by an ancient and not inappropriate name, the apeiron

It is evident that the highest and lowest levels of specifiables, that is, the apeiron and the actual, have unique properties distinguishing them from each other and from all the intermediate levels In all the intermediate levels where definite conditions are specified, a field of possibilities consistent with the conditions is marked out, and a complementary field of impossibilities inconsistent with the conditions But in the apeiron there are no impossibilities, and in the actual there are no possibilities These properties follow immediately from the fact that the apeiron has no conditions, and the actual has nothing but its conditions

Another way in which these two polar specifiables are distinguished from the intermediate levels is in our manner of knowing them Both are unknown except by extrapolation from the intermediate levels This must be obvious enough so far as concerns the apeiron A state in which no conditions are discerned—no memories, no anticipations, no pressures or compulsions—is a state humanly unthinkable except in terms of a progressive relaxation of conditions to a limit at which no conditions are conceived We first imagine some set of conditions and then imagine these conditions or any other conditions negated We imagine the apeiron, in other words, only by conceiving an opposite and then hypothecating the negation of that opposite It differs from nothing simply by being absolutely anything Even the postulates of chance would not hold here, for these are definite conditions however general

But the statement that the actual is also known only by extrapolation from intermediate levels of specifiables is not likely to gain such ready acceptance Surely, it will be declared, any immediate experience as it is lived in, or lived through, is an experience of the actual It may be an experience of the actual, I admit, but it has never been shown (and I suspect never will be shown) to be in any sense whatever a knowing of it—not even when knowing is interpreted as awareness, or immediacy, or knowledge of acquaintance of, or "having " All these interpretations of the knowledge of the actual are *interpretations* referred to the actual from certain metaphysical hypotheses These interpretations are *possible* ways in which the actual *may* be known And the very fact that there are several apparently equally possible interpretations of the way in which the actual may be known, is itself sufficient evidence that the actual is not known except by some mode of reference from a set of *possible* conditions I am not playing on the too-well-known ambiguities of the word "knowledge " Let "knowledge" mean anything you please I guarantee to show you, that, whatever you define "knowledge of the actual" to mean, you will be dragging into your definition a set of conditions such that the most you can legitimately assert is that the nature of the actual *might* be such and such, not that it is Our knowledge of the actual is entirely hypothetical We approach it through hypotheses which are levels of possibility Those hypotheses which give us the closest approach to the actual are, I believe, those few relatively adequate metaphysical hypotheses which have been maturing in the last three milleniums of our culture We do not know the actual except as an extension from our knowledge of possibilities

Yet, of course, most of us believe that possibilities rest upon actualities Most of us believe that the whole hierarchy of specifiables is supported on its lowest level Just as the determinable, color, could scarcely be given significance without reference to some determinate hues, so most of us believe that the determinable, possibility, at any level of specifiables could scarcely be given significance without reference to determinate actualities But with respect to specifiables, this is a matter of sheer belief, however adequately justified There is no contradiction between this belief and the judgment that the actual is known by reference only The belief that the possible rests upon the actual is itself hypothetical

and analogical It is barely possible that the actual does not exist, just as the apeiron undoubtedly does not exist It is possible that the lowest level of specifiables, which has ontological status, is not a level of complete specification excluding all alternatives In fine, it is possible that the universe never achieves actuality in the sense defined but only a level of some, presumably rather high, degree of specification, and that in this level numerous alternatives intrinsically abide [2]

The foregoing paragraphs may be regarded as a preface to what follows, which I shall make as short as I can From what has been said, it is clear that a theory of possibility is itself a possibility of the second degree at least It is at the very least a theoretical possibility of the nature of possibility It states what possibility would consist of according to a certain possible hypothesis. We naturally take our hypothesis as close to actuality as we can, for we are not interested in some wild or fanciful theory, we wish to obtain as adequate an account as we can We consequently turn to some relatively adequate metaphysical hypothesis for the theoretical framework of our description Incidentally, it might be noticed that, contrary to a popular notion, a metaphysical hypothesis, far from being abstract, is one of the most concrete of specifiables One is never so close to actuality (if there is such a thing) as when one is in the arms of a relatively adequate metaphysics

There are several relatively adequate metaphysical theories to which we might turn Each one is an alternative conception of nature That fact, as I have said, is exactly what makes the descriptions of every one of these conceptions only possibilities At the moment, I happen to be particularly interested in a type of theory which I have called contextualism—a type represented by Dewey and Mead and by some others equally well known, and by a number of the men who have written papers for this present volume I shall try, then, to sketch a contextualistic theory of possibility And in order to bring the discussion more definitely to a focus, I shall for the most part restrict my illustrations to the possibilities of time The possibilities of time will be regarded as typical of the possibilities of anything else in contextualism

[2] For a fuller treatment of the situation to which the preceding paragraphs allude, see my article, "Middle-Sized Facts," *Univ Calif Publ Philos*, XIV (1931), 3–28

I must assume familiarity on your part with the general categories of contextualism It is the theory that takes for its root metaphor the textured event, with its richly qualified strands fading into a past that dies and guiding the changing pattern of a present duration into a future that dawns The event through its texture extends sidewise in its present duration into neighboring contexts which are themselves textures extending into still other contexts. And the texture of each event is internally analyzable into strands, which have individual tensions and references into other textures This is the basic conceptual equipment of contextualism

As a contextualist for the moment, I invite you to intuit what these somewhat metaphorical terms refer to in what we are accustomed to call the facts of our experience, and as I describe one or another aspect of the world in these terms I request you to seek the concrete referent of the description in your own life A contextualist does not offer proof in the ordinary sense of the word for his interpretations, he merely attempts to point out, denote, certain ways in which things go If other persons can follow him smoothly, that is all he pretends to give in the way of justification of his theory That is all, he believes, that any man ever does succeed in giving in the way of justification of anything intellectual. If an expositor and his companion differ about the rightness of some path that is being pointed out, the expositor will take some other path or set of paths which both he and his companion agree are feasible, and will try to show that these other paths lead back after all to the path on which they started, or better, he will show his companion that the path originally pointed out does lead after all to a destination regarding which they had previously agreed

Now, the point of departure for a contextualist is always the texture of his own duration block This for him is ultimate actuality This, in Dewey's term, is what he "has " In the "having" of it, it is what it is But, of course, it is fugitive It is constantly fading into the past and growing into the future. In any individual duration block or specious present, the past that has entirely faded is not actual, nor is the future that has not yet dawned. Actuality is limited to the specific qualified texture of the present duration block I shall return to the nonactuality of the past and the future in more detail presently But right now let us keep our eye on actuality.

We see where actuality stops for an individual texture at its past

and at its future How far does it extend sidewise into its context? One must notice that there is no clear line of demarcation between a given texture and another texture in the given texture's environment The context of a texture is its environment, and its environment consists of other textures with their own individualities It is strands of a given texture passing into other textures that give to these other textures the status of being the environment or context of the given texture The character of a given texture is furthermore in part determined by the character of the environing textures that is to say, by its context The reason for this is that strands are possessed in common by intercommunicating textures There is no evidence for such a thing as an isolated texture Textures occur in contexts and the character of a texture is constituted very largely by its context It follows that the actuality of a given texture guarantees the actuality of its context, for, if the context is not actual, neither is the given texture, since most of its character results from its context From the actuality of given texture, then, we derive the guaranty of the actuality of the textures of its environment This is directly given on reflection about the primary nature of any example of immediacy in contextualism

If now we reflectively shift our perspective from the center of the given texture from which we started to one of this texture's environing textures, we shall see that the context of this second texture includes textures which were not part of the context of the original texture It is like shifting one's point of observation from one hilltop to a neighboring hilltop Both hills are in view of each other, and a large part of the landscape that can be seen from one hilltop can be seen in a different perspective from the other hilltop, but from each hilltop there will be objects visible which were not visible from the other In this manner we can pass from hilltop to hilltop and sooner or later we come to a hill from which our original hill is invisible, and still later we come to a hill from which nothing that was in the visible environment of the first hill is to be seen We do not, however, believe that the hill from which we started has ceased to exist simply because we no longer see it nor anything that was seen from it We realize that the only reason we no longer see it, is that it is out of sight We can plainly see a hill from the top of which we remember seeing a hill from the top of which the first hill was plainly visible

It is somewhat after this manner that we reflectively gain our guaranty of the extent of actuality in a present duration A given texture is of course actual by direct immediacy The textures incorporated in the environment of the given texture are guaranteed actuality by direct immediacy plus the reflection that these textures must have their environments just as the given texture at which one happens to be has its environment The textures in the environment of the textures which are in the environment of the first given texture, are guaranteed actuality by the reflection that these textures differ from the textures found in the original given immediacy only by the fact that they lie outside the range of immediacy of the given original texture By making use of this process of extending actuality through contexts, reflection can now define the range of actuality for contextualism Actuality consists of all the textures that are either directly or indirectly in the environment of a given texture By being indirectly in the environment of a texture, is meant that a texture is in the environment of a texture which is in the environment of a texture and so on till we come to a texture that is in the direct environment of the given texture

This definition assumes that there are no isolated textures or isolated webs of textures There is, however, nothing in contextualism to make it impossible that there might not be such entirely separate comets or even solar systems of actuality A more extended definition of actuality can easily be framed to include these This can be done by noticing that the textures defined by the previous definitions all fall within the boundaries of present duration. The function of our first definition was to indicate that there was an extensive sidewise range of actuality within present duration. Not only does a given texture fall within a present duration, but also all other textures which are directly or indirectly in the given texture's environment Now extend this concept of present duration beyond every environmental connection with a given texture, and any texture connected or unconnected with any given texture may be conceived as actual provided it falls within the boundaries of present duration In short, according to this more extended definition, anything is actual which falls within present duration.

It is important to notice, however, that this concept of present duration has no content except as an expansion from the intuition

of a characteristic of a given immediate texture—an expansion over the web of all textures in this texture's direct or indirect environment, and thence at large into whatever may be beyond any traceable environment of a given texture Isolated textures and isolated webs of textures lying outside the particular web of textures, in which we, who are communicating with one another, happen to be caught, are as much speculative entities as Spinoza's infinite attributes We know nothing of them, and it is inconceivable that we should For all practical purposes our first definition of actuality is sufficient

By now, someone will be wondering why the method of extending actuality through contexts, which we have just used to define actuality sidewise in present duration, should not be equally applicable to the extension lengthwise of actuality into past and future Is not a future texture also one that is simply out of sight? Is not that texture also connected with a given immediate texture by a succession of interconnecting textures? And is not the same true of past textures? Are not past and future textures, therefore, as actual as the vast range of present duration recently defined?

Contextualists generally answer, No though Professor Adams[3] partially dissents Contextualists generally assert that present duration alone is actual, that the future is possible, and that the past, except as a phase of the future, is nothing Paradoxical as these judgments sound, they are so close to the truth as the contextualist sees the truth that it is wise to keep them continually in mind in all their sharpness however much a closer scrutiny of the conditions involved leads to a softening of them It is, I think, a softening of these judgments without an outright denying of them, that Professor Adams has suggested

Let us look at the conditions pertinent to this situation in any given texture Suppose we take as an example the present apprehension of a short sentence, and suppose we choose for that sentence one the content of which bears directly on our problem I select a sentence from William James "The *feeling* of the thunder is also a feeling of the silence as just gone."

There are undoubtedly many persons here who can apprehend this sentence read at ordinary speed as wholly within one present

[3] Present volume, pp 6 ff

duration The first few words are still sensuously vibrating when the last word is heard It is very easy, however, to read the sentence so slowly that the first phrase has definitely faded into the past before the last word comes The sentence nevertheless does not lose its meaning Consider the sentence read slowly in this way It will then have its past outside a present duration, and, as it is read word by word, a future also outside the present duration, and at its completion a total meaning Here is a little contextualistic model of actuality with the paradoxes of past and future attached right to it What can we find in it to our purpose?

We find, first, a definite thickness of present duration We take in a number of words in a given act of apprehension, and every one of these words is actually there, though in a definite order of succession In the phrase, "the *feeling* of the thunder," it would be ridiculous to say that the word *"feeling"* had no actuality when the word "thunder" was uttered Both words are equally prominent in immediacy We do expect the word *"feeling"* to go into the outer past sooner than the word, "thunder," but as long as both are sensuously present in the duration block they are equally actual. There is no question about the full actuality of anything within the duration block

But what about the words yet unsaid? Within the duration block, at any time before the sentence is completed, there are strong forward-leading tensions These are as actual, though not so easily demonstrable, as the substantial words Stop the sentence, say, at "A *feeling* of thunder is also a " The tension is intense A strand of the texture is pulling hard out into the future, and it is a pull in a fairly definite direction It is just like the sidewise pulls out through present duration, such, for example, as those now making up what we call the connotation of "thunder"—just like them except in one important respect that this particular strand may not get attached to anything Indeed, it did not I left it dangling on purpose. The sentence never got completed, and never will. Furthermore, it will always be a problem how I might have completed it Perhaps I was going to say "A *feeling* of thunder is also a dreadful sensation " How can anyone know what I was going to say, or, in other words, how that texture was going to complete itself? Only alternatives can be offered In other words, the future of that sentence was only a possibility It was not an actuality. And

that is always true of any future event, no matter how fully reasoned out our predictions may be The sun may not come up tomorrow morning We simply have no good reason to think that it won't, and many good reasons to think that it will. But still it may not come up, and that bare possibility which attaches to anything conceived as ahead of a present duration makes everything out there possible only

But some of these possibilities are so closely connected with the present context of a texture, especially when the present duration is just opening to receive them, that they are scarcely distinguishable from actualities A tennis ball is served off a racket from an opposite court It speeds toward me Before it passes over the net, there are several things I might do As it is about to bounce, I have so moved that there are only a few things I might do As it bounces and I am swinging for it, there are only two or three little things that I might do, or that the ball might do As it comes up toward my racket, and my racket closes down on it, and there is only a distance of inches between the two the coming event seems inevitable; it is as good as actual The strands of the context are converging to a closure and to the completion of a texture And yet at that very moment how many improbable things might happen! The future is never inevitable except in some speculative fairyland, says the contextualist For all facts are like James's sentence, or a ball flying toward a racket, and the facts of a laboratory are in no way different in principle The future is possible only That, I think, must be accepted, and yet just beyond the bounds of the present the future is so nearly determined by the converging strands of the textures of the present that a sharp line here between actual and possible belies our intuition The strands of present texture which are tendencies moving directly under our eyes in immediate duration are possibilities in actuality, or actual potentialities So much of possibility do these actual tendencies contain that they can be accurately described only in terms of future ends This condition is as important to notice as the other one, that, strictly speaking, the future is possible only. The future is possibly only, yet the actual present, to use Professor Loewenberg's figure, foreshadows the future This shadow is the imminence of the convergence of multifarious actual tendencies The present is a long wave about to break into the future, it breaks; and then, with

a new intricate pattern of foam, hangs over the next future It is this imminence and trend that makes prediction as reliable as it is, and gives continuity to nature To say that the future is only possible without qualifications, is to conceal this continuity of nature The immediate future is a thick, highly conditional possibility. It is possibility qualified by all the trends of present actuality This qualification, however, thins out rapidly the farther we look into the future

And now of the past That, we shall find, is also a thick possibility It has an advantage over the future in having been actual The future can never make that claim But it is at a disadvantage with the future in that all verificatory references are directed into the future The future can therefore smile at the proud claims and imagined security of the past so far as the past bases these claims only on having actually been These claims can never be verified except in the future The substance of the past, so far as it is ever questioned, lies wholly in the future The future can therefore well maintain that there is no past except as a certain peculiar phase of the future

This way of conceiving the past has, in fact, been the customary way for contextualists They have maintained that the past literally is not, or at least that there is no evidence for it They have maintained that there are no conditions to define its possibility When an event ceases, it is no longer actual All that is left are certain actual things in the present which we call signs of the past But to call them signs of the past is a misnomer, for they turn out to be signs of the future Suppose I find a circle of ashes and a pile of tin cans in the high Sierra and within the hollow of a tree a tattered *Collier's* dated July, 1931 I say these are obviously signs that somebody camped in this spot in the summer of '31 But suppose my statement is questioned, how do I verify it? Only by certain acts directed into the future And when the statement is finally verified, where will it be actually verified? In some actual duration now only a possibility in the future There seem to be no conditions determining anything but the present and the future For this reason, contextualists, as I said, commonly deny the past except in the form of a peculiar sort of future possibility

This extreme position seems to me not wholly justifiable even on strictly contextualistic grounds In the first place, the most a con-

textualist is justified in saying about the past is that there is no evidence for it He implies, however, that the past is impossible There is a great difference between these two statements Moreover, these two statements are often confused by contextualists with a third statement, namely, that the past is not actual. The three statements are very different from one another That the past *is* not, that on contextualistic grounds it is not actual, there can be no question What is actual is present duration, and the past, falling outside of present duration exactly as the future does, cannot be actual We must take that as settled But that fact does not exclude the possibility of the past

Similarly, the fact that there is no evidence for the past (if that is true) also does not exclude the possibility of the past When there is no evidence for a possibility, the possibility is very thin, to be sure But within a given set of conditions anything is a possibility which is found not to be inconsistent with those conditions There is nothing that I can see about the conception of a past that is inconsistent with contextualistic categories On this score the status of the past is analogous to that of isolated textures An isolated texture we found to be a possible actuality for contextualism, and what makes such a texture isolated is precisely the fact that from our particular web of texture there is no evidence for it Now, a past texture cannot be a contextualistic actuality, but it can *have been* such an actuality Even if the present systematically cuts off all evidence of the past, it does not thereby cut off the possibility of the past Does some contextualist object that this argument is question begging, in that it assumes the past in asserting its possibility? I merely answer that the future which we always admit to be a possibility is in a parallel condition with the past so far as general possibility is concerned He cannot maintain that an isolated present texture is impossible Can he, then, maintain that an isolated future texture is impossible? Yet that isolated future texture for which there is no evidence is not actual. Is there any difference between asserting the possibility of an isolated future texture and asserting the possibility of an isolated past texture?

If now some contextualist asserts that this issue is meaningless for contextualism by the very nature of this theory's theory of meaning, which implies strands of connection, I must agree on the basis of such material as we have brought to the problem up to this

point But this statement signifies only that we have reached the point where new material must be brought in On the basis of considerations which will occupy the remainder of this paper, I think it will be seen that the distinctions just urged are not meaningless

So far, I have been arguing that a contextualist cannot consistently deny the impossibility of a past Now I wish to suggest that on contextualistic grounds there is definite evidence for the possibility of the past I shall try to show, moreover, that this evidence is exactly the same as that for the possibility of the future, but viewed other end to Let me remind you of the content of that sentence I quoted from James, "The *feeling* of the thunder is also a feeling of the silence as just gone" It is not just thunder It is thunder connected with silence A strand of texture joins the silence with the thunder The quality of the total texture depends upon the contrasting strands and the connecting strand of contrast The movement in the duration block is of course forward toward the future But how can movement in a present duration be toward the future unless it is also away from the past? And in the illustration the sense of pastness, "of the silence as just gone," is perhaps even more vivid than that of future as just coming

Contextualists have had a tendency to forget that a *terminus a quo* is as essential to the movement of strands in present duration as a *terminus ad quem* They insist upon a continuity and by a strange trick of attention omit to notice what makes that continuity continue The back of a strand is as intimately involved in its movement as the front

Let me explain this parallelism between the past and the future by means of the same illustrations as I employed to exhibit the thick possibility of the immediate future I wish to show that the immediate past has just as thick a possibility as the immediate future I am of course referring to the past that lies just outside the rear of the duration block

Consider James's sentence read slowly. "The *feeling* of thunder is also a feeling of the . " Now at this point I seem to find that my duration block has this thickness ". . . of thunder is also a feeling of the " The second "feeling" seems to have dropped the first "feeling" out I held on to the first "feeling" until the second "feeling" came, and then the first "feeling" seems to have been let go just because, strangely enough, the two words are so intimately

connected The first "feeling" is now past It is no longer actual But what I think you cannot fail to notice is, that the rear ends of the strands of the sentence dangle over that past just as the forward ends like tendrils reach toward the future And these dangling ends, I say, still vibrating with the breath of an actuality just gone by, are as good evidence for that immediate past as forward-reaching ends are for the immediate future

Furthermore, just as there is an intricate convergence of strands upon the future more and more definitely guaranteeing that future as the present duration moves on, so there is an equally intricate backward convergence of strands definitely guaranteeing the past For consider the tennis ball from the end of the server, not as before from the end of the receiver When the ball strikes the server's racket, his hitting the ball is an actuality It is still an actuality as the ball is speeding forward on his side of the net That is of course literally so in contextualistic terms The fact of the server's hitting the ball and the perception of the ball in the air six feet from the server's racket are both actual though not simultaneous facts in present duration Both these facts lie within the duration block They are therefore equally actual As the ball approaches the net, the server's stroke recedes in the duration block, and soon fades into the past But at the moment of its fading there is scarcely a possibility that the speeding ball was not served from the server's racket The act of service, to be sure, is now past It is outside the actuality of the duration block But a whole reticulation of strands diverge from (or, conceived backwards, converge to) that act Not only does the path of the speeding ball dangle just this side of that act, but also a whole series of movements executed by the server, and many less obvious but equally actual series of movements executed by all the onlookers at the game also dangle just in front of that act The whole texture and context of that play converge toward the probability that the present speeding ball was propelled by an act of the server. Of course, the improbable is possible here, just as the improbable might have happened when the ball was six inches from the racket of the receiver The ball might be an emergent novelty that appeared just at the beginning of my present duration block But so completely does the texture and context of the present situation seem to generate from the server's act of serving the ball, that that

service, though undeniably past and not actual, is almost as definitely assured as any section of the ball's path now actual in present duration In twenty minutes, or tomorrow, or next year, this server's action might reasonably be doubted But now, with a whole situation so obviously growing out of that act, no one but a philosopher would even entertain the conception of its dubitability.

Therefore I maintain that for a consistent contextualist the status of the past and that of the future are exactly symmetrical From the point of view of any present actuality, there is just as much evidence for an immediate past event as for an immediate future event, and this evidence thins out for a past event the farther into the past we look, just as it thins out for a future event the farther into the future we look The evidence for the immediate past and future is, I maintain, so great that to speak of these as only possible, true though it be, is misleading Present actuality is generated right out of the immediate past, and the immediate future is generated right out of the present The immediate past and future are thick possibilities To lump together all the past and all the future, however, as if any past or future event were as possible as any other, is, I believe, also misleading Thick possibility that owes its nature to the richness of actual present texture extends not very far into datable past and future

I just said "datable past and future " That brings us to another phase of time Past, present, and future as a succession of dates are very different things from the present, future, and past that we have been talking about up to the present moment The latter series is an actuality together with a direct extension forward or backward of the actuality, the former series is a scheme The kind of possibility defined by a scheme is very different from that defined by an actuality Schematic possibility is the kind of possibility which science possesses, it is also history regarded as a record of events Science, for a contextualist, is, in content, a collection of schemes for the prediction of the future; history, a collection of schemes for the ordering of the past. Both science and history define possibilities How far they ever describe any actuality is always problematic But their status in actuality is that of being schemes—being schematic textures

A calendar is an excellent example of such a scheme. What is a calendar and what kind of possibilities does it define? Here is one

on my desk that has not yet found its way into the wastebasket My life insurance agent sent it to me as a New Year's memento. As an object on my desk, you see, it has many interesting strands of suggestion irrelevant to the order of time But we will dispense with these, and turn our attention to the pattern of letters and figures arranged in squares in a rectangle Even this pattern is not, strictly speaking, the time scheme It enters into the time scheme only when these lines and surfaces become symbolic of something more than lines and surfaces, and the letters as symbolic of something more than proper names, and the numbers as symbolic of something more than the ordinal series We presently find that this pattern which my insurance agent sent me is simply a stimulus to lead me into a texture of intricate articulation and wide extent. The texture, in fact, turns out to be a social structure, which in ways little understood reaches throughout our epoch and stiffens it Or, to change the metaphor, the scheme is like a melody on the air When I look intelligently at my insurance agent's memento I tune in on that melody Millions of other people are tuned in on the same melody and our actions consequently develop a bearing on one another which is definitely felt, difficult as it may be to trace out precisely what that bearing is

But now we have pushed into the scheme too far to learn much about it Let us retract our attention and direct it more closely upon the pattern of figures on the desk And instead of just contemplating the pattern, let us think of something to do with it A friend invites me to dinner on Sunday, the thirtieth of April I have his note before me and I turn to the calendar The first thing I do is to find out where I am in that scheme Perhaps, being in some doubt, I look for the morning paper I find this dated Saturday the fifteenth of April Of course, this date may be in error The paper may not be this morning's paper, but that of a week ago This possibility may occur to me and lead me to seek some corroborative evidence for this paper's being this morning's paper. Strangely enough, the thought does not occur to me (except as a philosopher here writing) that the paper may be that of a week hence—but I will not enlarge upon this second possibility! Let us assume that I become sufficiently convinced that this paper is this morning's paper It is still possible that the date on the paper is not correct But I dismiss this thought also It occurs to me that

the date of a newspaper is probably the one item of news in it that can be reliably accepted I become convinced that today is indeed the fifteenth of April

I look at the pattern of squares and figures which my life insurance agent so considerately sent me and discover the number fifteen in the middle of the pattern It turns out to be, as the newspaper said, a Saturday Well, that is where I am in the calendar. I am, metaphorically speaking, in the middle of that pattern

Now what do I do? I look to see whether the date mentioned in the note of invitation lies above or below the date at which I metaphorically am in the pattern before me Why do I do that? Because the pattern suggests to me a rule to the effect that I cannot now make preparations for actions to take place at dates previous to a date in a calendar pattern at which I find I metaphorically am This rule and a few other analogous rules are in fact involved in and are part of the texture of schematic time represented by this pattern before me I do find that the thirtieth of April lies in the pattern below the fifteenth of April The pattern then represents to me the possibility of accepting my friend's invitation It represents much more It shows me that, barring other engagements, there are fourteen other dates in April at which I could now accept an invitation to dinner, and it shows me, other engagements or not, that there are fourteen good dates in April at which I could not possibly now accept any engagements to dinner, because these dates lie prior in the calendar to the fifteenth of April, at which date I now metaphorically am Had my friend's note invited me to dinner on the thirteenth of April, I should now be compelled to decline his kind invitation, and should surmise that the note had been temporarily lost in the mail, or had stayed too long in my friend's pocket, or was sent as a practical joke, or had met some other accident

The calendar acts as a tool by means of which I can infer whether or not a purpose can now be instituted which I can reasonably believe will lead me to the satisfaction of sitting with my friend at dinner The calendar informs me that if I now institute such a purpose, I may expect my purpose to be consummated On the basis of this information I write a note of acceptance to my friend, and perform some other acts of preparation such as noting down the date in my pocket diary

The function of schematic time in all this was to act as a tool to inhibit or promote the present initiation of a purpose, that is, of a texture with strands leading out of present actuality and intentionally not given satisfaction within the present duration block Schematic time furthermore guides this purpose from date to date On Monday the twenty-fourth I send a shirt to the laundry, on Thursday the twenty-seventh I watch for its return; on Saturday the twenty-ninth I get a hair cut—and so on The scheme not only initiates the purpose but also guides it and keeps it in order

But all the while, it must be realized, these so-called future dates (as equally the so-called past dates) are mere possibilities They have, indeed, with the development of physics and astronomy, become very intricate possibilities For the series of dates which constitutes schematic time is, as the little we have just seen of it shows, much more than the series of ordinal numbers extended out of the present It involves the moon and the sun and the fixed stars and becomes implicated with gravitation, clocks, meter rods, and suppositions of imaginative scientists It is a scheme related to many other schemes, or, we might say, it is one schematic peculiarity of a certain system of schemes This system of schemes gives order to actuality as the wave of duration moves forward It gives order to actuality through millions of details just as the calendar gave order to the one detail of my acceptance of a dinner invitation But it must not be thought that these schemes, in any other sense than that of their functional power, determine the structure of actuality So far as they function in present duration, they are certainly structural features of actuality They are actual textures operating within the present duration block But there is no justification for believing that reality in any other way than that just mentioned, corresponds to these schemes, or looks like the sensuous models that we use to symbolize them These schemes are simply complicated textures in present actuality, which we find particularly reliable instruments for the prediction and organization of future satisfactions. They give detailed definition to distant possibilities They have not the quality of almost intuitive sureness which attaches to the thick possibilities of immediate past and future, but they more than make up for this deficiency by their range of application Where the infantry of thick possibilities becomes thinly scattered, they lay down a heavy barrage of fire, and

hold down an astonishingly wide extent of territory by the accuracy of their guns Or perhaps it is not so much the accuracy of the firing that makes the movement of the infantry into the future so secure, as the accuracy of the infantry in moving forward under the barrage The gunners could perhaps fire almost at random and still make the future safe for the infantry, provided only that the infantry moved under the cover of the most concentrated fire. It is barely possible that the gunners are firing at random!

However that may be, thick possibility and schematic possibility are in a way complementary to each other. The one is like a microscope, the other like a telescope Sometimes it is hard to tell them apart. But at a little separation they are easily distinguished The one is simply life itself, or nature itself, growing or dying; the other is rational speculation

In closing, I must remark once more that in the body of this paper I have been discussing just one possible theory of possibility. There are, I believe, three or four other equally adequate theories of possibility There is one for subsistent realism, one for objective idealism, one for mechanism The theories of possibility generated by these other relatively adequate types of philosophy are, so far as I can judge, as adequate as the theory generated by contextualism. I have here tried only to find out and describe what the nature of possibility must be for a contextualist And for a contextualist I find that possibility consists of all references that extend beyond a present actuality. These references are of two sorts those that reach immediately forward and backward out of the texture of the duration block, and those that reach far and wide from certain peculiar textures, which I have called schemes.

POSSIBILITY AND PLURALISM

BY

WILLIAM SAVERY

POSSIBILITY AND PLURALISM

WILLIAM SAVERY

I. THE FIELD OF MEANING

POSSIBILITY LIES WITHIN the field of meaning This has been stated by several of the writers in this volume, including Professors Adams, Loewenberg, and Marhenke. Professor Mackay has said that no analysis of facts discloses possibility Possibility is not an attribute of the actual nor a relation between actuals It is true that we, as thinkers, characterize the actual as also possible, but this is only when we relate the actual to a wider field of meaning Consequently, it is necessary to characterize the field of meaning, and especially the larger part of this field, namely, the field of reference

There is direct experience There is focalized acquaintance with parts of this experience, which parts are facts or data There is also a descriptive characterization of these facts, as when I say, "This is green," or "This is on that" Such a description may be said to be a meaning in the widest sense of meaning, although the description does not step beyond the facts Such descriptions do not employ variables

Most of our thoughts, however, refer beyond themselves They have objects, or at least objectives, and these objects or objectives are meanings which constitute the field of reference They embrace everything that we think about intelligently which lies beyond the duration block They include, first, my past, second, my future, third, other minds; fourth, the physical world; fifth, the supernatural world (if any), and sixth, fictions Fictions include (*a*) false propositions, whether believed, disbelieved, supposed, or doubted; (*b*) questions which would be truly answered in the negative, (*c*) commands never executed; (*d*) wishes unfulfilled; and (*e*) downright fictitious things, such as Prince Genji and the mock turtle In another paper I have explained the nature of references

beyond the duration block [1] James's and Dewey's account of reference as restricted to the future is entirely inadequate The reference backward to the past is necessary on James's own theory, since, according to him, we say at the end of the process of verification, "This is what I meant " There are also references to other centers of experience, to an external world and to fictions, as already mentioned I cannot enter here upon an extended description of objective reference, but certain statements are necessary

My first thesis is There are simple references beyond the duration block When I abstract any relation or attribute, any predicate in short, it would have no meaning without a reference to "some" further content, the reference of the variable In logical terms, every abstract propositional function includes the variable For example, "with" is a relation and it is the nature of a relation to relate To think of any relation as a non-relating relation, as Russell did in 1903 in his *Principles*, is absurd If we abstract the relation from its specific terms we refer to "some" terms We have the thought of something "with" something, $x_1 R x_2$ If we abstract an attribute we have a reference to one term Loudness has no meaning except as the loudness of something Such references as these are simple references and since we abstract from facts we can always find examples by acquaintance or denotation

My second thesis is There is a genuine thought synthesis in which we think of two attributes or relations combined on the same variable Take a very simple illustration I may think not only that something is round and that something is red but I may also think that something is round and also red, that is, I may think of a round red thing Now round red things are found in direct experience, but there are syntheses of this sort that go beyond such experience Take the illustration of a purple fish I can abstract the spatial form of a fish from the visual aspect of a goldfish in a pool and the purple from the visual aspect of a petunia growing beside the pool, and think of the combination of these two abstractions It is true that I may also form an image of a purple fish, but this image is not a percept In order to think of a perceptual purple fish I must think of a combination of the content of the image with the vividness abstracted from some actual percept Purple fishes

[1] "On the Nature of Objective Reference," *Jour Philos*, XXIII (1926), 393–407

doubtless exist I remember having seen them in the aquarium but I cannot now find them in my experience, I cannot now denote them, they are objects of reference or meanings

My third thesis is There are references not only to things that are, but also to things that are not I can think of a purple fish but I can also think of a purple lotus in the sky So far as meanings are concerned, man is the measure both of things that are and of things that are not Some of these things are not now but were in the past Others are not now but will be in the future Still others have no being either in time or out of it, in every sense they are not; they are not things, if by a thing I mean anything that has being. There are no mock turtles When I have the thought of a mock turtle I do not have the thought of what is actually a being I can only say, paraphrasing Mr G E Moore,[2] I have the thought of that which, if it had being, would be a mock turtle I cannot say, with Professor Loewenberg, that possibles are actual in the divine imagination The divine imagination is only a reference to the possible worlds which are not actual at all I cannot say, with Mr Strong, that the Mad Hatter is actual in Lewis Carroll's story. There is the written story of the Mad Hatter, there are the words, Mad Hatter, there is the picture of the Mad Hatter, there is the image of the Mad Hatter (copied I hope, from the original picture), there is the thought of the Mad Hatter; but there is no Mad Hatter The Mad Hatter is not a being, he is not actual, he does not exist nor subsist, he is not real, the Mad Hatter is not a fact. It is the thought of him which is delightful, whimsical, and altogether charming I cannot even say that the meaning is, there is only the thought of the meaning—the reference to the meaning

No philosophy which does not admit of reference to things which are not can possibly stand When Royce makes all objective reference consist of a relation of one part of the absolute to another part, his theory is self-refuting. If there is any absolute, he must think of things that are not, since I am a part of the absolute and I think of things that are not.

We have not yet reached the meaning of possibility, since the field of meaning contains both possibilities and impossibilities. If we identify possibility and meaning we must then distinguish, as

[2] *Philosophical Studies*, pp 216 ff

Professor Adams did, between genuine and spurious possibilities. Spurious possibility is not genuine it is Pickwickian: it is impossibility, the contradictory of possibility My contention is only verbal, but I think it conduces to clearness to use the word possibility with only one meaning I shall therefore use the words *meaningful* or *significant* for the wider sense. and dichotomize the significant into the possible and the impossible. The significant is the sphere in which the possible falls This sphere when it goes beyond the actual, is a product of synthetic thought. If we do not restrict the word imagination to the production of an image, but use it in its popular sense of creative thought, we may endorse the following:

> "The gleam of an heroic act,
> Such strange illumination—
> The Possible's slow fuse is lit
> By the imagination"

II THE POSSIBLE AND THE IMPOSSIBLE

Historically, the primary locus of the meaning of the possible and the impossible is presumably the will The impossible is what is willed but not effectuated. If an end is first willed and then achieved, it is said that it was possible at the time it was willed. The impossible, however, involves a conflict, a contradiction between the purpose and the outcome

Nevertheless, the meaning of the impossible has been generalized to include all contradictions and I shall confine my discussion to this generalized meaning Unless the meaning can be stretched to include other incompatibles I shall define impossibility as contradiction Hence

My fourth thesis is Impossibility is contradiction. It has been maintained by certain philosophers that there is such a thing as synthetic incompatibility Johnson[3] says,

> if any determinate adjective characterizes a given substantive, then it is impossible that any other determinate under the same determinable should characterize the same substantive; e.g., the proposition that "this surface is red" is incompatible with the proposition "this [same] surface is blue."

Professor Lovejoy[4] says,

> I seem to myself to be unable to attach any consistent meaning to the state-

[3] *Logic*, I, 181 [4] *The Revolt against Dualism*, p 139

ment that one and the same surface not merely appears to different beholders to be, but actually is, both purple and green.

He adds, however,

Nevertheless, I am told by persons of logical acumen and practice in introspective discrimination that they find no difficulty whatever in thinking of such simultaneous dual or multiple coloring of an identical surface, and I feel bound to admit the possibility that they do in fact achieve this, to me, elusive feat

Professor Lovejoy seems to admit that the impossibility is an inconsistency But Johnson does not state whether it is an inconsistency or not I wish to say, first, that if it is not inconsistent I have difficulty in grasping the meaning of its being logically impossible Secondly, I am one of those who are unable to find any incompatibility If instead of the determinable, color, we take the determinable, taste, there is no incompatibility between determinates, since the same sip of coffee may be both sweet and bitter. If we take color, it seems to be only a matter of fact that a surface cannot be both red and blue in the same experience There is a great difference between a red-blue surface and a round square. There is no contradiction in a circle inscribed in a square The contradiction arises through the notion of one and only one boundary and that boundary being both round and square, that is, both round and not-round Now, if I presuppose that a surface has only one color that color cannot be both red and blue, but I do not need to make any such presupposition The same surface may be red in one perspective and blue in another, and it is not logically impossible that there should be families who could perceive the two perspectives combined I shall continue to limit all impossibilities to contradictions

It has been denied that impossibilities fall within the range of significance The answer to this has been elucidated by Professor Marhenke's admirable, as well as timely, analysis Nevertheless, it might be maintained against him that each of two incompatible propositions has a meaning, but that there is no meaning when we try to put them together Langford[5] says, "we shall have to say that two incompatible propositions never do give rise by conjunction to a third proposition, and that this is precisely what it means

[5] Lewis and Langford, *Symbolic Logic*, p 476.

for two propositions to be incompatible" I wish to support Professor Marhenke's thesis by further argument

First, the *reductio ad absurdum* There have been various attempts to limit the range of significance that are untenable Take first the classical attempt of Parmenides We have four fundamental theses (1) Being is Granted, a tautology (2) Not-being is not Another tautology (3) Thought of being is Granted (4) Thought of not-being is not What is it you cannot think of, Parmenides? Not-being Do the words not-being have a meaning or not? If they do, then you have thought of it If they do not, substitute a nonsense word for it—ogliwog Then the theses are as follows (1) Being is (2) Ogliwog is not, or ogliwog is ogliwog (3) Thought of being is (4) Thought of ogliwog is not, or thought of ogliwog is ogliwog It is safe to say that Parmenides' philosophy will not follow from these four theses It is clear that we know the meaning of nothing-at-all A pessimistic friend of my early philosophic days once said to me, "If I could press a button and blow the universe, not into little bits (for they might reassemble again) but into nothingness, I wouldn't hesitate a moment to do it" I knew what he meant Take Herbert Spencer who said that infinite space is inconceivable, not because it is space but because it is infinite Substitute a nonsense word ogliwoggian space is inconceivable If Spencer were an honest philosopher he would admit, "This is not what I meant"

A similar dialectic applies to the classical Hindu illustration, the son of a barren woman, a clear contradiction When I say that the son of a barren woman is impossible, I have the meanings, not only of son and of a barren woman but also of the son of a barren woman, since I say, not that a son is impossible, nor that a barren woman is impossible, but that the son of a barren woman is impossible As James[6] has said

> We think of a thing *about* which certain facts must obtain but we do not yet know how the thing would look when it is realized. The natural possibility or impossibility of the thing does not touch the question of its conceivability in this problematic way. "Round square," "black-white thing," are absolutely definite conceptions.

When I make the statement, "The proposition p is incompatible with the proposition q," obviously I have thought of an incom-

[6] *Principles of Psychology*, I, 463

patibility or a contradiction, and the meaning of this statement is a proposition, since a proposition and a complete meaning are one and the same

Secondly, it is easy enough to understand how a contradictory proposition is framed Just as I frame a complex propositional function through the identity of the variables in "x is round" and "x is red," so I frame a complex propositional function through the identity of the variables in "x is round" and "x is square" Certainly, I am not acquainted with a round square As James says, I am thinking of it in a problematic way But that is true of all objective references I do not so much think *of* meanings as *at* them, but it happens that we use the word *of* instead of *at* I think of a mock turtle, so I think of a round square I once listened to a conversation between a small boy and his mother The boy had previously asked his mother, "Would you be afraid of a bear out of a cage?" and then, "Would you be afraid of a bear in of a cage?" He then said, "Would you be afraid of a bear-out-of-a-cage-in-of-a-cage?" The mother's expression was one of perplexity She said, "Child, what do you mean?" With an obvious tone of contempt, he replied, "I mean two things at once" He was wiser than his mother and some philosophers

Thirdly, if contradiction has no meaning then no proposition could be negatively verified, since in a negative verification we "spot" an inconsistency between a proposition and a fact

My fifth thesis is Possibility means the absence of impossibility. In spite of the negative word, impossibility is the prior and positive conception Possibility, as we have seen, lies within the field of meaning, and I may describe a meaning But if you ask me whether the meaning is a consistent one I must look for contradictions If I find the meaning exemplified in experience, then I know that there are no contradictions If I cannot find it exemplified, I develop my meaning fully and look for contradictions in the meaning If I find none I may then believe (rightly or wrongly) that the meaning is consistent In any event, possibility means consistency I agree entirely with Professors Lenzen and Loewenberg in the identification of possibility and consistency I would add that possibility *as such* is consistency, although of course in a particular example we must specify what the proposition is and with what other propositions, if any, we are comparing it A proposi-

tion may be possible in itself and yet not com-possible, to use Leibniz' term, with other propositions I shall discuss this later

Professor Loewenberg has said that possibility is epistemic and Professor Adams that possibility is constitutive—an apparent contradiction I agree with both and I think they agree with each other The whole field of significance which includes both possibility and impossibility, is the meaning of thought Without a thinker, both possibility and impossibility would have no status So far, possibility is epistemic Once granted this field, the nature of impossibility and its difference from possibility belong to the field In this sense they are constitutive When I think of a contradiction I think of *a* as other than itself, and that *a* is other than itself is exactly what the principle of contradiction denies Further, consistency is absence of contradiction, and since absence is never anything actual its status must always be the meaning of a thought There is another meaning of contradiction, namely, the affirmation and denial of the same proposition, but this meaning is secondary Further, this contradiction is not only possible, it takes place daily I cannot, as a matter of fact, affirm and deny the same proposition in the same breath but the statement of this factual impossibility is not the law of contradiction I conclude The contradiction which is an impossibility is constitutive in the field of reference I may remark parenthetically that the two diverse meanings of the a priori correspond to the two senses in which possibility and impossibility are epistemic and constitutive We *construct* the entire field of significance, that is the first meaning of the a priori. Secondly, we discriminate by inspection the logical possibilities from the impossibilities therein, and this is the a priori of logical and mathematical analysis

In the conclusion of this section I wish to say a word about the apeiron As the widest of all specifiables, the apeiron, if still significant, is plainly "some being" Since this applies to everything, it admits of no actual contradictory; everything actual is an example of it It does, however, have a contradictory in the field of significance, namely, not-anything, or nothing-at-all. This is a meaning, as I have previously explained If the apeiron is emptied of all significance it is logical nonsense It would seem then to be similar to the One of Plotinus and of Pseudo-Dionysius in that it is beyond both being and nonbeing And there I will leave it

III THE ACTUAL AND THE MERELY POSSIBLE

As we have seen, the contradictory of the possible is the impossible and not the actual Indeed, it is a commonplace of logic that the actual entails the possible although the possible does not entail the actual Hence, I shall divide the possible into the actual and the merely possible As explained above, possibility is not an ontological predicate of the actual, it is nothing positive at all. After we have established our field of meaning we may then describe the actual as free from contradictions In this sense, and in this sense alone, is the actual possible

The possible is divided into the actual and the merely possible · this is my sixth thesis It would not have occurred to me to emphasize this thesis if it had not been denied by Professor Pepper and at least encroached upon by Professor Lenzen Professor Lenzen has maintained that the merely possible is prior to the actual in the sense that we may say that an actual table is the sum of the actual and possible aspects of it Now, I have no objection to the thorough manner in which, both in his book[7] and in his lecture in this series, he has worked out the procedure of a scientific positivism, but I do not think he should call possible aspects in any sense actual Such actuality is spurious and not genuine. No part of the actual can be reduced to the merely possible

I think, however, that it would be not out of place to make a few remarks concerning a present tendency of ascetic renunciation on the part of certain scientists There are mathematical nominalists, for example, who tell us that, as mathematicians, they do not know that two plus two makes four but only that this proposition is entailed by the postulates of arithmetic There are other mathematicians, whom I might call ultra-nominalists, who, as mathematicians, do not even know that the theorems of mathematics follow from the postulates For them, mathematics is only the result of the manipulation of symbols very much as certain kinds of fabric are the result of the manipulation of needles and yarn. Mathematics is a kind of knitting. In both groups the philosophers or the meta-mathematicians are left to find out what is true or false Further, we have had positivists in physical science who would leave to the philosophers the determination of whether there

[7] *The Nature of Physical Theory*

probably are electrons or photons And Professor Tolman and other behaviorists would generously hand over introspective psychology to the philosophers In spite of this scientific asceticism I think that the general trend of science is in the other direction—that a sound mathematics can be deduced from self-evident axioms, since all mathematics is a huge tautology, that the principles of irrelevance and parsimony[8] give a genuine probability for the truth of the theories of physics, and that the great task of the psychologists of the future will be the correlation of the results of introspection with the laws of human behavior Philosophy has given birth to its children, the sciences, and even a kangaroo would find it inconvenient to take its adult offspring back into its pouch

I am not able to share Professor Pepper's doubt concerning the actual There cannot be possible objects of reference without an actual reference, an actual thought If the thought were only a possible thought it would be the object of reference of another thought, and, if this were possible only, it would be the object of still another thought, and so on *ad infinitum* Since the significant is sustained by the actual, without the actual the possible is impossible and the impossible also is impossible I now feel as though I were swimming in the apeiron

It seems to me that the first pages of Professor Pepper's lecture do an injustice to his previous paper on "Middle-Sized Facts,"[9] since, after all, middle-sized facts are facts no matter how inaccurately he thinks they are described I agree with Professor Pepper that there is no kind of truth that is not denied by someone Brouwer has denied the principle of the excluded middle, which is one form of the principle of contradiction Mrs Eddy denied the fact of pain, and Sankara denied all facts of experience The White Queen is not alone in having "believed as many as six impossible things before breakfast" Some truths, however, seem to be certain, I should say, they are certain It is logically certain that a thing cannot be other than itself; that red is different from blue, that this patch is extended, and it is certain (although not logically certain) that I enjoy listening to Professor Pepper's excellent exposition of the contextualist theory

[8] "Chance and Cosmogony," *Philos Rev*, XLI (1932), 150–158
[9] *Univ Calif Publ Philos*, XIV (1931), 3–28

It is certain, first, that there is acquaintance with facts, and secondly, that we derive simple propositional functions by abstraction from facts, and thirdly, that there is, to some extent, an accurate description of facts since we describe facts by means of the predicates abstracted from them What we must assume, whether we are contextualists or not, is that we remember the past and extrapolate to the future, and that on the basis of these assumptions we reach probable conclusions concerning the distant present So far as I can see, valid references backward, forward, and outward are implied not only by contextualism but by all other "adequate" systems of philosophy I am sure that I have arms with which to embrace my fellows, and legs that have walked out of the past and will walk, however haltingly, for some time into the future I think it is exceedingly probable that there is an external world

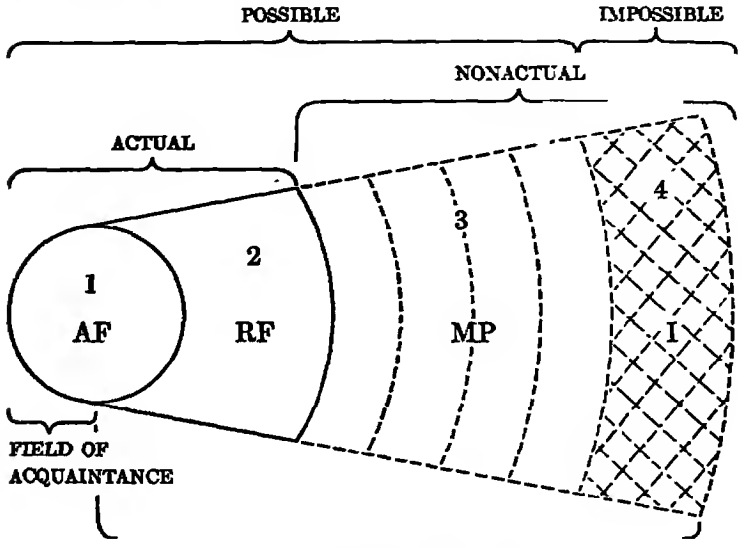
> "A little madness in the Spring
> Is wholesome even for the King,
> But God be with the Clown
> Who ponders this tremendous scene—
> This whole experiment of green,
> As if it were his own!"

My seventh thesis, then, is The actual may be correctly divided into, first, the experience of the duration block, and secondly, the actual beyond direct experience, which, if apprehended at all, is a part of the field of reference Thus we return to the direct experience with which we started We have made three major divisions in the realm of meaning Before we go further I think it would be well to recapitulate in an inclusive scheme There is a Hindu legend that the universe is a vast cosmic egg We may transfer this figure to the entire universe of discourse, which would then look something like the figure on page 212

The first division (reading from right to left) separates the impossible from the possible, the second division separates the actual, or the factual, from the nonactual, the third division separates the field of acquaintance from the field of reference. This gives us four parts The first (reading from left to right) is the facts with which we are acquainted, the other three parts are the field of reference The second part is the facts to which we refer; the third is the merely possible, the fourth the impossible The first is the

germ; the second the yolk; the third the white; and the fourth the wind egg.

In an earlier part of the paper I followed Leibniz in distinguishing between the logically possible and the com-possible; between a proposition which is consistent with itself and a proposition which is consistent with other propositions or with the facts As we pro-



The universe of discourse

gressively widen our statements of the facts the possible is correspondingly narrowed The entire third division of our egg is logically possible but we have within it successive narrowings (indicated by lines in the diagram) as our factual data increase I can add nothing here to the account of the stratification of possibilities as developed by Professor Lenzen except to say it is not only laws but also facts which narrow the possibilities. I shall return to the subject of laws later.

Before ending this section I should like to comment on the use of certain words that are synonymous with the word "being" or at least closely allied to the word "being" We have the following

terms and their opposites (1) being or entity and not-being; (2) actuality and nonactuality, (3) fact and fiction, (4) reality and appearance

I make no distinction between an actuality and a fact. Indeed, it is customary to use, for the noun, "fact" instead of "actuality," and, for the adjective, "actual" instead of "factual." Secondly, I can make no distinction between a being or an entity and a fact The mock turtle is not a fact, neither is it a being

It might be said that an event in the past is not actual but has being, but such an event is not a being now, it was a being in the past, precisely as the event is not actual now but was actual in the past A being, a fact, and an actuality have for me, then, precisely the same meaning The meaning of being is unanalyzable but it is one which all who are not philosophers, and most philosophers also, understand There are, however, other pairs of terms which attempt to dichotomize the realm of being Such are "existence" and "subsistence," and "the natural" and "the supernatural." I may not believe in subsistence or the supernatural, but I do not believe that they are contradictory I merely cut them off as irrelevant The pair of terms, "reality" and "appearance," is somewhat similar to these latter pairs in its attempt to divide beings into real beings and apparent beings The word "appearance" is ambiguous It may mean something that shows up in experience In this meaning it is a being, as in the New England expression, "The newlyweds appeared in church this morning" In this sense an illusion or a dream is a fact Or, secondly, it may mean that there is the belief that something is a being when it is not a being, for example, a child believes that there is a mock turtle when there is no mock turtle, that is, no being Such a meaning is false So-called appearances are, then, either facts or false propositions Facts are actual. False propositions are never actual In my opinion, it would be very much better for philosophy if the word "reality" were discarded and the two kinds of appearance were designated as "facts" and "falsities" If the word "reality" is to be used it should be a precise synonym for the aggregate of beings or facts I would not say, with Professor Adams, that possibilities are real I would say, it is true that such and such is possible, that is, certain meanings are either consistent with themselves or consistent with certain designated facts My disagreement with Professor Adams is

presumably verbal If AB is customarily followed by T, then A may be said to be a capacity If AC is customarily followed by T, A, in the presence of C, may be said to be a tendency I agree with Professor Loewenberg that the alternatives of Professor Adams' are groups of capacities None of the preceding lectures has hypostasized a *potentia* Mr Strong's account of the subject seems to me thoroughly sound

IV POSSIBILITY AND CHANCE

I cannot enter here upon an extended discussion of probability, which is a far more intricate subject than simple possibility Probability, however, may be regarded as a measure of possibility, with its two limits, impossibility, or a probability of zero, and certainty, or a probability of one The principle of uncertainty is established at present in physics and it seems likely that it will be permanently triumphant [10] Assuming the truth of this statement, there remains no strict determinism in nature, and chance takes the place of laws Instead of laws we have correlations which are summations of chance These correlations are only probable, that is, possible If we should say, then, as Professors Lenzen and Mailhenke did that the physically possible or the biologically possible is whatever is consistent with the laws of physics or biology, we should then mean that what is possible is what is consistent with another possibility, and we do not yet reach consistency with the actual facts

We must distinguish, however between the past and the future although in both possibility means consistency with all the data Thus I may say that it is possible that I had mushrooms for dinner on August 11, 1925 But it is not possible that I stayed away from the Greek play and worked on my paper last Friday evening I may, however say that it was possible for me to stay away, that is, it was consistent with all the other data up to that time

We have no data out of the future In the future everything is possible Everything is possible and yet not everything, for the probability, and so the possibility, is a restricted one If we know the position of an electron at a certain instant to a high degree of approximation, we do not know where it will be after a certain duration, but some positions are more probable than others It is as though we had a die, with an ace on one face, deuces on three

[10] "Chance and Cosmogony," *op cit*, pp 171–173

faces, and three spots on two faces [11] The restrictions are constant and the rest is a matter of chance We extrapolate the constants in nature, the remainder is equality of possibility We may say, then, that a future physical event is possible if it is consistent with the past and present facts and the physical constants Presumably, similar remarks could be made about the possibility of future biological events if we knew the biological constants If new constants emerge in the future, the problem is more complicated; and I shall not follow it farther

V TRUTH AND FALSITY

Before dealing directly with the possibility of pluralism I must first give an account of truth and falsity [12] My eighth thesis is All falsity is contradiction and all truth is tautology since the only consistent description of fact or meaning is tautology I shall divide my brief exposition into two parts

1 *Correspondence and verifiability*—It is customary for those who have been influenced by pragmatism (and this applies to several writers in the present volume) to replace correspondence by verifiability Philosophy has fortunately sloughed off the extreme pragmatism, I might say the pseudo-pragmatism, of Schiller and of James in the second lecture of his *Pragmatism* The pragmatism of the earlier and the later James and the instrumentalism of Dewey is a prediction and verification theory of truth Truth is, primarily, the verification and, secondarily, the verifiability of a prediction Since verification is a process with a terminus *a quo* and a terminus *ad quem* we may adopt a threefold classification of the truth of propositions First, a proposition is true at the consummation of verification This consummation I shall call confrontation Secondly, a proposition is true which will be verified. Thirdly, a proposition is true which can be verified, although the verification will never take place (Professor Adams' eating of the poisonous mushrooms is an example [13]) This we may call psychological verifiability. Such a pragmatism is not, as it stands, an adequate theory even of the truth of extensional propositions,

[11] I owe this illustration to Professor R. H. Fowler.

[12] I have dealt with this subject more fully in a paper, "The Synoptic Theory of Truth," read at the joint meeting of the Western and Pacific Divisions of the American Philosophical Association at Berkeley, in December, 1930 I may refer to it as a "possible" publication.

[13] Present volume, p 10

since we make assertions which refer to the past or to inaccessible regions of space or of other minds These may be indirectly verified to some extent in the future but they cannot be directly verified at all They are verifiable only in a Pickwickian sense We may, however, generalize our pragmatism by holding that such propositions are true provided they would be verified if we could remount the past or reach these inaccessible regions I shall call such verifiability "logical verifiability" and pragmatism, so generalized, I shall call "logical pragmatism"

Such a pragmatism may be easily shown to be the same as the correspondence theory properly analyzed If I entertain the proposition that I was in Berkeley last Friday, this proposition is identical with the facts But identity is nothing actual, it is the absence of diversity If I entertain the false proposition that I was in Seattle last Friday, the proposition is diverse from the facts, but I cannot believe that there is an actual relation of diversity running from the facts to a mere meaning When a false description is applied to the facts of direct experience I may say there is an actual confrontation but when I describe something beyond direct experience the falsity of the description consists only in this, that a diversity would be discovered if the confrontation were made The analyzed correspondence theory turns out to be the same as pragmatism generalized, and if pragmatism is not generalized it is not, as we have seen, an adequate theory of truth

2 *Correspondence and tautology*—The analyzed correspondence theory seems to be adequate when applied to the truths of propositions of an extensional logic, but unless it is further generalized it breaks down completely when applied to intentional or modal propositions Their falsity consists in contradiction, their truth is tautology In dealing with such truths the pragmatists and the correspondence philosophers have followed different paths The former (James and Dewey) have denied analytic truth entirely This is an easy verbal solution but it is entirely sterile. The latter have invented supposed facts with which the propositions correspond. The truth of a mathematical proposition, however, is not its correspondence with facts Euclidean geometry would be true were there no Euclidean space If space is non-Euclidean there are neither equal nor unequal vertical angles in Euclidean space, nevertheless, Euclidean geometry discriminates between

them It holds that the former are possible and the latter impossible Mathematical propositions are modals

We seem to have, then, two meanings of truth first, absence of contradiction in modal or intentional propositions, and, secondly, correspondence or logical verifiability in ordinary extensional propositions But a little analysis will show that absence of contradiction is the meaning of truth in the second class also Most ordinary propositions are not verified at all In such propositions both positive and negative verification do not take place Take the classical proposition, "Caesar crossed the Rubicon" This proposition is not verified, so both positive and negative verification have the same status in fact Neither is actual, but there is this difference between them positive verification is not actual, but negative verification is not only not actual but also impossible The proposition that Caesar did not cross the Rubicon is contradictory to the facts Truth is possible verification, falsity is impossible verification Truth and falsity, in the last analysis, are modals

There is of course some difference between the falsity of ordinary propositions and the falsity of modals In the latter the contradictions are in the data We may be certain of them In the former we have only a probable and not a certain knowledge of the contradiction since the contradiction lies beyond the data in the objects of reference And so of truth Modal truth is known tautology, ordinary truth is only probable tautology, not certain but believed There is a certain sense, as Professor Marhenke has shown, in saying that even modal inconsistency must be sometimes sought Mathematical propositions must be completely developed or the inconsistency will not appear Similarly, inconsistency in ordinary propositions must be sought in connection with all the facts This analysis fits the previous account of the stratification of possibilities,[14] with the one extreme of a purely logical possibility and the other of a possibility which is consistent with all the facts. In this last possibility the actual alone is possible. Obviously, we can never have complete knowledge of the future since future data are not at hand, and, except some memories the truth of which we accept, we have only probable knowledge of the past

To summarize In modal truth we have, at least in principle,

[14] Lenzen, present volume, p 57

certain tautologies. In ordinary propositions that go beyond acquaintance we have only the probability of tautology, but if our data could be complete we should have no possible doubt and of ordinary falsehood we could say.

> "I bet with every Wind that blew, till Nature in chagrin
> Employed a *Fact* to visit me and scuttle my Balloon!"

and of truth:

> "Search in and out and round about,
> And you'll discover never
> A tale so free from every doubt—
> All probable, possible shadow of doubt—
> All possible doubt whatever!"

VI POSSIBILITY AND PLURALISM

Professor Adams has said that the test of a sound philosophy is the provision it makes for possibility With a sure sense he selected philosophies like those of Hume and Bergson, in which everything is possible, and philosophies like those of Bradley and Bosanquet, in which nothing is possible I think we can now see that the error of Hume and Bergson lies in their lack of continuant constants which restrict the field of possibility and probability These constants I have already discussed I shall now direct my attention to the opposite view of Bradley which by denying possibility, reaches a rigid monism

There are four and only four possible hypotheses concerning the number of beings in the universe These are (1) monism, (2) concatenism, (3) monadism, and (4) a combination of concatenism and monadism I shall define monism as the hypothesis of an all inclusive being According to this view, however many beings there may be there is one Being which includes them all There are various subtypes of monism There is mystical monism which denies the validity of all description, and abstract monism which accepts attributes but denies relations Since attributes and relations obviously exist I shall consider only what I shall call concrete monism I shall define this as the view that there are n substantives or concrete particulars and that these are united by an n-adic relation into an inclusive whole. This whole is a single individual

The other three views are pluralisms Monadism is the view that there are many beings which are unrelated Each of these beings is a monad and the monads are "windowless" Concatenism was suggested by the synechism of Charles Peirce and developed into a specific theory by William James It holds that the universe is a chain of beings or individuals There is overlapping of the links but there is no inclusive being A fourth possible hypothesis is a combination of monadism and concatenism It would hold either that there are many chains, or one or more chains and one or more monads The theoretical weakness of monadism is apparent Since the monads are unconnected, one monad could never know the others Leibniz attempted to save monadism by his "preestablished harmony," but this is clearly a dodge since it relates the monad of monads to all the other monads There may be monads outside the universe to which we belong If there are I shall ignore them since I can know nothing about them Similar strictures apply to the combination of concatenism and monadism So far as our universe is concerned—that is, the universe that can possibly be known to us—either monism or concatenism is true If concatenism is possible it is probably true, since the monistic hypothesis would then become irrelevant In monism there is an n-adic relation, in concatenism

> all the relations may be of a much lower order—the upper limit of Concatenism would be a world where the highest type of relation is $(n\text{-}1)$-adic .. In a monistic universe every entity is related to every other entity. The n-adic relation includes all these dyadic relations as a part of itself It includes also all triadic and tetradic relations and so on, up to and including the $(n\text{-}1)$-adic type, i e , it includes all the relations that are necessary to constitute a concatenistic universe, and many others besides These additional relations are irrelevant in reference to our present state of knowledge.[15]

I said that concatenism is probable if it is possible Bradley denies that it is possible I select Bradley because he seems the ablest of the monists His argument runs as follows: Let us suppose, as in pluralism, that A and B are two unrelated individuals. It is then true that A is other than B; that is, A is actually other than or diverse from B. Hence, A and B are not unrelated. Further, a relation is a connection; hence, A and B are connected and in their

[15] "Chance and Cosmogony," p 159

connection make an inclusive whole Bradley's argument was directed against monadism but it applies to concatenism as well since, as I shall show later, in concatenism there is no actual relation between links even if they overlap Bradley's entire argument depends upon the assumption that true relations can never be possible but are always actual The validity of his argument depends upon the status of possibility My ninth thesis is Pluralism is possible

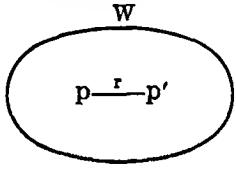
1 *Connection and conjunction*—Bradley offers no evidence, and can offer none, that logical conjunction means an actual connection If I say that Nefretiti was the wife of Ikhnaton and that Li Po was sometimes intoxicated, I am not asserting a connection between the content of the two propositions A connection, direct or indirect, there may be since the facts somehow belong to what we call the same universe But this is not referred to by the word "and" In general, when I make the conjunctive proposition p and q, the word "and" refers only to the universe of discourse or of meaning This relation I shall call conjunction or the "and relation" I shall use the word "connection" or the term "with relation" to designate an actual relation in the realm of being

2 *Differentiation and diversity*—In a similar manner, when I think of the conjunction of two propositions in the universe of discourse I shall call their otherness "diversity" and shall reserve the term "differentiation" for the otherness of two entities that are actually connected—for the fact that actual relations, as Bradley said, connect things *apart* We may make a cross-classification of these two pairs of relations, using the neutral term "joining" for either connection or conjunction, and the term "disjoining" for either differentiation or diversity The classification is as follows.

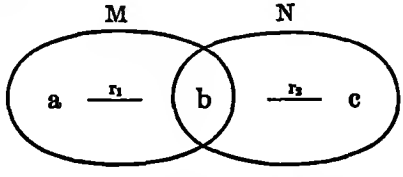
	Actual	Nominal
Joining	Connection *with*	Conjunction *and*
Disjoining	Differentiation	Diversity

I shall now apply this to the discussion of pluralism.

3 *Overlapping links*—My thesis here is that two overlapping links have the relations of conjunction and diversity in the universe of discourse and not those of actual connection and differentiation First, it is clear that identity is nothing positive, it is only the absence of diversity Secondly, there is no actual relation of whole and part We may analyze the so-called relation in this way · If W is the whole and P is the part, there is an actual connection, r, between P and P', P' being the other part or parts of W. The situation is this W is identical with PrP' The relation of whole and part, then, is the conjunction of two relations; first, the relation of identity, which is nominal, and, secondly, the relation between P and P', which alone is actual We need glue to glue the part to another part, but we do not need more glue to glue the part to the whole It may be illustrated thus

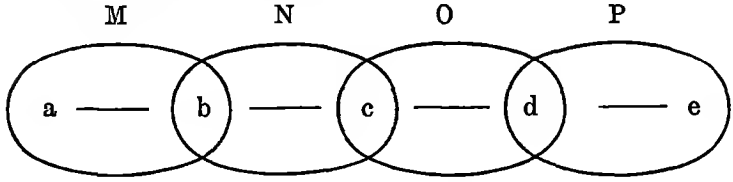


Now let us consider the relation of overlapping Let us take two links, M and N, and let us suppose that M is constituted by $a\ r_1\ b$ and that N is constituted by $b'\ r_2\ c$ The relation of the overlapping of M and N is analyzed as follows M is identical with $a\ r_1\ b$, and N is identical with $b'\ r_2\ c$, and b is identical with b' The relations of conjunction and identity are nominal, r_1 and r_2 are actual Between M and N there is only logical conjunction and diversity, not actual connection and differentiation The situation may be illustrated in this way



It is obvious that nonoverlapping links have the relations of conjunction and diversity and not those of connection and differentiation

4 *Time and space* —Let us suppose that we have a chain of duration blocks illustrated thus·



In this chain there is no actual relation of sequence between *a* and *e* If we say that *a* is before *e* we mean that *a* is before *b, and b* is before *c, and c* is before *d, and d* is before *e* The proposition that *a* is before *e* is a conjunctive proposition There is no fact that *a* is before *e;* there is a conjunction or aggregate of facts The proposition that Caesar crossed the Rubicon (before now) is not made true by *the* fact that Caesar crossed the Rubicon before the present It is made true by an aggregate of facts, the chain that stretches from Caesar to the present Even a chain is not a fact, it is a conjunction or aggregate of facts Similar considerations will apply to space if space is concatenated and not an inclusive whole

5 *Difference and similarity* —Let us take two nonoverlapping links of a chain, say the first and the sixth links We will call them M and R Let us suppose that M has only one color, red, and R has only one color, green What is the meaning of the proposition that M and R are different in color? According to concatenism there is no actual relation between the two entities, the color difference of M and R is not a fact The proposition that M and R are different in color is a conjunctive proposition It means that M is red *and* R is green *and* red is different from green Let us take as a concrete example the red coat of a mandarin in Nanking and this green pencil Monism may, of course, be true It is possible that there is an actual relation of difference which runs from the coat to the pencil. the two facts may be actually compared in an absolute mind The verification of the conjunctive proposition may, so to speak, be performed But I do not need to assume the actual verification, I may substitute logical verifiability If the verification were to take place only one solution would be possible Similarity is a contradiction, an impossibility Difference remains as a possibility

6 *Diversity and possibility* —We can now understand the man-

ner in which two links of a chain are diverse If we discard prime matter as a superfluous conception, two diverse links of a chain are dissimilar If the first and seventh links of a chain are not dissimilar they are the same link and the chain from the first to the seventh link is closed But whether or not there is prime matter two dissimilar links cannot be identical for that would be a contradiction Such diversity holds in the universe of discourse This may readily be seen if we consider fictions

First, let us take two meanings that do not correspond to anything actual a mock turtle is other than a rocking-horse fly, that is, if there were a mock turtle it would be different from a rocking-horse fly if there were a rocking-horse fly I can never verify this diversity through the actual facts since there are no facts to be diverse But to say that a rocking-horse fly and a mock turtle mean the same is a contradiction, that is, an impossibility

Secondly, let us consider the relation of a fact to a fiction When I say that a mock turtle is not a turtle I do not mean that there is an actual rod of connection and differentiation which runs from a turtle which is to a mock turtle which is not I mean that to identify the two is a contradiction and therefore an impossibility.

Thirdly, the same situation obtains when I am dealing with two facts with different sets of predicates which are not parts of an inclusive whole To say that they are identical would be a contradiction, that is, an impossibility But identity is the contradictory of diversity If it is impossible for two facts to be identical they must be diverse They are not actually differentiated within a connected and inclusive whole They are diverse in the universe of discourse I conclude that Bradley's argument is fallacious Pluralism may be true

In conclusion, a word about values Whether there is an inclusive being or not there is no inclusive good The satisfactions and pleasures of life are manifold, imbedded in a matrix which is indifferent Good facts are many and the *summum bonum* is not a fact The highest good which we can achieve is an aggregate of facts, the proposition which would describe it is conjunctive; the truth about it belongs to the universe of discourse From an actual which has come largely by chance we reach toward a possible good, "the gables of the sky " God is only possible